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THERE are very real and proper reasons for hesitating to talk of courage to an assembly such as this, and the first is that in the good old days, not so long ago perhaps, both the lecture and the lecturer would have been officially banned. It would have been tacitly assumed that courage was inherent in every soldier because he was a soldier, and that under no imaginable circumstances could any soldier lack this quality. It would have been realised that any inquiry into courage must inevitably involve an inquiry into fear, a most reprehensible and dangerous subject for discussion in a school of military instruction. Moreover, seeing that courage is part of the official equipment of every soldier, that it rains upon him as manna rained upon the Israelites in the Wilderness, what possible benefit could accrue from an analysis of this heaven-sent virtue, even supposing that any analysis was possible?

Secondly, one instinctively hesitates to trespass on ground which has been consecrated, and that so recently, by so many great deeds and immortalised by some of the greatest writings in history. But it is as little my intention as it is within my power to declaim the virtues of courage or indulge in panegyrics. My object is quite other than that, and instead of eulogising the manifestations of courage I shall attempt to investigate its origin and purpose, together with the factors which modify it in one direction or another, not forgetting that this quality is not wholly confined to man, still less to the male sex, and that in man, in whom it reaches its highest pinnacle, there is the courage we call moral no less conspicuous and no less instructive than the courage we call physical.

My third ground for hesitation centres round the word psychology, a subject which has occupied the public stage very considerably of late and that, too, in a not very attractive way. The advance of science has always been along the path of hard work, and its progress has never yet been assisted by public parade or advertisement, factors which more often than not have tended to bring the thing studied into confusion, or even disrepute. We have evidence of this in the pseudo-scientific craving evinced for psychological theories in recent years, and we are now witnesses of the unedifying spectacle of an indiscriminating public flocking from Freud to Mrs. Eddy, from Christ to Coué, with an impartiality that might be refreshing were it not pathetic. We are here to-day, however, to study the psychology of the natural rather than that of the morbid, and seeing that this is a lay assembly I shall be able to dispense with the luxuriant language of modern psycho-pathology and have recourse only to words that we can all understand. You must not expect me to indulge in any metaphysical abstractions, for towards these I feel much as Gibbon did when he alluded to "the science, I should say the language, of metaphysics."

THE MEANING OF PSYCHOLOGY.

What, then, do we mean by psychology? We mean the study of the mind as part of the organism; and just as we cannot study the bodily organism without considering the stages through which it has been evolved, so is it unwise and misleading to study the mind of man apart from his history. Similarly the study of individual behaviour is meaningless and empty unless we also study environment, and the environment of man is essentially man. In other words, the behaviour of any organism—and courage is nothing more than a quality of mind, however noble, associated with certain lines of behaviour—is conditioned largely by evolutionary factors. The only proper method, therefore, for pursuing the study of the mind is the comparative one, and once we realise that psychology is merely a branch of the larger science of biology we shall feel confident that we are on safe ground. I accordingly approach the psychology of courage from the point of view that "Nature has made up her mind that what cannot defend itself shall not be defended."[1] Now the idea that courage has been acquired along evolutionary lines, and that is the argument I propose to elaborate, might at first sight seem a little cold and forbidding to those who, content to indulge in a purely intellectualistic psychology, prefer to regard this noble quality as the particular and cherished attribute of man alone. But our bodies have been evolved through processes extending over millions of years, and have they lost anything of dignity or beauty in their evolution? Does its embryonic origin and intra-uterine development detract from the wonder of the infant or its beginnings in a seed from that of the flower? On the contrary, knowledge enhances wonder.

Again, just as it is a mistake to investigate the activities of man or of any other animal apart from their histories, so is it unsound to divorce the study of the activities of the mind from those of the body, for between body and mind there is an intimate co-partnership both in health and disease. Mental processes, particularly those associated with affect or emotion, are invariably accompanied by changes in the bodily state. It is not labouring the commonplace to draw attention to this fact; rather is it more correct to say that its universal recognition is responsible for the failure to realise its significance. Thus we blush with shame, cry with sorrow, when afraid we sweat and tremble, and when amused we smile. The stage, and particularly the kinema, actor depends for his success on the skill with which he can reproduce the physical manifestations of the emotions he is supposed to feel. Conversely it is well known that conditions originating within the body effect alterations in consciousness: hunger, for example, is associated with a particular type of contraction of the muscular wall of the stomach, and these contractions are terminated by the ingestion of food. Similarly, pain is accompanied by the inhibition or cessation of the secretion of gastric juice. Arguing on these lines it has even been suggested[2] that the source of behaviour is to be found in the periphery, or, to put it colloquially, the stimulus which compels the organism to such behaviour as shall satisfy its cravings arises in the organs of the body rather than in the higher nervous centres, while the latter merely serve to coördinate and integrate these various cravings of bodily origin. I mention this somewhat fantastic theory in passing in order to impress upon you the inter-dependence of mind and body.

COURAGE IN LITERATURE.

Proceeding now to examine the subject of courage as it appears in literature, certain features demand our attention.

The first is that courage is applauded for what it is, as an entity, and little if any attempt is made to investigate the elements of which it is compounded or the motives which underlie it. The element of fear, for instance, is either completely ignored or glossed over, and courage is left in splendid isolation, the perfect quality, heaven-sent, and "people forgive everything to it."[1]

Secondly, perhaps because it lends itself more readily to treatment, or perhaps because it is more intelligible, the courage of the individual rather than that of the mass takes pride of place in the literature of all ages and nations.

Thirdly, it is interesting to observe that the actual words by which this quality is described have not always had the same meaning.[3] This is not the case

with the word "courage," which although used by Chaucer as synonymous with "heart" (from the Latin "cor") as the seat of feeling, rapidly became identified with spirit, liveliness, vigour, and finally with readiness to face danger. With the word "bravery," however, it is different; derived from a French or Spanish source, it originally denoted the action of braving or acting the bravo—i.e., daring, defiance, boasting, swaggering, bravado—while the noun "brave" indicated a bully or hired assassin. Only later did it come to mean courage, valour, fortitude, and even now it sometimes implies show, ostentation, splendour, or finery, as, for example, in a description of a London crowd in the park, "Tens of thousands in all their Sunday bravery." So again the adjective "bold," an old Saxon word, was and still is used to indicate not only the stout-hearted, courageous, and fearless, but also the audacious, presumptuous, the opposite of modest, as in the phrase "a bold young woman," or "bold-face," meaning an impudent person. Bacon used "boldness" as synonymous both with impudence and hot-headedness; "the right use of bold persons," he says, "is that they never command in chief, but be seconds and under the direction of others; for in counsel it is good to see dangers, and in execution not to see them except they be very great."[4]

Fourthly, the most divergent views are current regarding the type of individual who is courageous, and the extremely varied incidence of courage has often been a matter for surprise. During and since the war, for instance, people have busied themselves with such intangible problems as to whether colliers are braver than clerks or artisans than farmers, problems which have proved unexpectedly difficult to solve. Captain John Brown, the hero of Kansas, held the belief that the quiet peaceable man makes the best soldier; "as for the bullying drunkards of which armies are usually made up, he thought cholera, small-pox, and consumption as valuable recruits."[1]

> "'Tis still observed that men most valiant are
> Who are most modest ere they came to War."

On the other hand, we have the opinion of one[5] who, writing about the recent war, remarks, "One of the things that astonished me most was to find out the types of men who were most brave; the drunkards, the rakes, and the dandies were a long way first. The high-minded, religious people of strong principles were often good diers, but not often good fighters. The orderly, well-disciplined, obedient types were more often than not quite useless in the face of the enemy." He goes on to say how he was discussing the psychology of bravery with Sem, the French caricaturist, and "was telling him how extremely gallant were the dandies and the fops, and he made this wise answer, 'Après tout, le courage—c'est une élégance.'" In the course of this lecture I hope we shall find some means of reconciling such opposite opinions, and shall come to understand that courage is something much more than "une élégance."

DIFFERENT FORMS OF COURAGE.

It is customary to recognise certain forms of courage. First and foremost is the pure and sublime courage, its beauty lauded in prose and sung in verse throughout history, "the endowment of elevated characters,"[1] a virtue regarded with reverence, awe, and envy, the sole prerogative of man. Such courage is eminently attractive from its being effortless and natural. It is characterised by equanimity and outward calm, and neither fear nor anger approach it; it is quiet, unruffled. Its tranquillity contrasts strangely with the power and energy it wields. "The immense esteem in which it is held proves it to be rare."[1] And at that we may leave it, not forgetting that women as well as men have contributed in no small measure to its irresistible appeal—Joan of Arc, Florence Nightingale. Psychologically this form of courage represents the complete success of the process by which fear is kept out of consciousness; this process, which is wholly unconscious, is called suppression.

Secondly, there is courage in spite of the presence of fear. Unlike "sublime courage" this form has received but scant attention in literature, and yet most of us would allow it to be one of our commonest modes of reaction to danger. The almost pointed way in which fear is ignored by the essayist suggests a disinclination to face facts which appear unpalatable and reflects a habit of mind both of writer and reader which prefers to arrive at comfortable conclusions rather than the truth. This method of dealing with unwelcome experience by professing to ignore it is, I believe, far less general than it used to be, and people nowadays are inclined to think with more honesty and less pretence. This advance has been greatly facilitated by the war, and especially is this the case with our views concerning courage. It is true that no one quite likes to admit feeling afraid, and such slang expressions as "wind up," "cold feet," and "needle," which enable us to talk freely about fear without actually naming it, are evidence of this natural disinclination. It was recently my privilege to listen to the evidence given by many eminently brave men before the War Office Committee on (so-called) Shell Shock; they all knew what fear was, and few of us would hesitate to admit in the words of one of them, and incidentally, one of you, that "All men know fear; some conceal it better than others, a few bury it out of sight, but it is there all the same."[6]

> "If you can force your heart and nerve and sinew
> To serve your turn long after they are gone,
> And so hold on when there is nothing in you
> Except the Will which says to them: 'Hold on!'"[7]

The second form of courage occurs, then, in the presence of fear, but fear is repressed sufficiently to allow of the dangerous situation being adequately dealt with; the process of repression is, however, not unconscious, as in the first type of courage, but conscious, sometimes acutely conscious.[8]

A third aspect of courage is recognised—namely, courage for the sake of display or notoriety, and it is in connexion with this form of courage in particular that the various meanings of the words "boldness" and "bravery" have their chief interest. From the psychological point of view this aspect of courage is of the greatest importance, for it implies that the individual is prepared to dare dangers in order to secure some advantage pleasing to himself. Now assuming that in the majority of individuals the presence of danger is normally associated with the presence of fear of some degree, we have here to deal with a case in which the emotion of fear is masked or actually replaced by another emotion—namely, the pleasurable emotion associated with personal advancement, gain, or success, which the individual anticipates. Now a much commoner mode of reaction to danger, both in animals and man, is by aggression, in which the emotion of fear is replaced by the emotion of anger; we "see red." Accordingly, I propose to call this third form of courage, whether it be the courage of anger or the courage of display, the "courage of substitution." It illustrates the complexity of the mechanisms at man's disposal, whereby threatening situations may be met, and, further, it constitutes a means whereby, when the danger is not averted, its consequences—namely, physical or mental pain—may be mitigated or completely suppressed by the substitution of some emotional state of great intensity. For example, a hack on the shin at football is often not felt until the game is over. Similarly, fervour, enthusiasm for a cause, especially religious enthusiasm, have inspired some of the most famous acts of courageous devotion, such as that of "the poor Puritan, Antony Parsons, who at the stake tied straw on his head when the fire approached him, and said 'This is God's hat.'"[1]

The last form of courage which is generally recognised is what one may call negative courage, or, if you prefer it, the courage of ignorance. Here it is implied that fear is absent, not because it has been consciously or unconsciously suppressed, nor because it has been replaced by some other emotion, but

simply owing to the fact that the emotional capacity of the individual is much below normal or even absent. A lunatic, for instance, may perform acts of prodigious valour, but they are merely the acts of lunacy, devoid of affective tone. Similarly it is well known that the unimaginative individual is often the most brave, because he is incapable of appreciating the probable consequences of his actions. Closely allied to this is "Dutch courage," where the higher nervous centres are dulled by the action of alcohol, and perception and judgment are grossly interfered with.

THE OBJECTIVE METHOD OF INQUIRY.

Such is my attempt to sketch the lines along which courage has been studied by the lay writer. We must now turn aside and follow another path—namely, the psychological one—and see in what direction it leads us. At the outset of any psychological inquiries the layman may quite properly and justifiably adopt a critical attitude and demand to know what *method* it is proposed to use. He will have no difficulty in understanding that A can investigate the *bodily* organs of B and study their behaviour both in health and disease, but an inquiry into the *mental* activities of B is quite another matter, seeing that its success largely depends on B's acquiescence in the inquiry. Or B may be willing to acquiesce in A's investigations, but A's methods of approach and his interpretations of B's mental activities may be unconsciously prejudiced by certain views entertained by A which are very dear to him. Thus crudely expressed we have the essence of the difficulty which surrounds all psychological inquiry. For thousands of years man has been interested in the study of his own mind, and has adopted for that purpose the obvious or common-sense method of introspection. The fact that this academic or intellectualistic psychology has been largely barren of results is attributable to fallacies inherent to the method, for it does not tell us what man is, but what he thinks and feels and likes himself to be.[9] This method was therefore discarded in favour of a more *objective* method of inquiry, which concerned itself particularly with behaviour—that is to say, with what the organism was doing. More recently the behaviourist school has been reinforced and finally replaced by another which, no longer content to ask "What is the organism doing?" insists on prosecuting the almost impertinent question "Why is the organism doing it? Why doing this and not doing that?"[10] The founder of this school is Freud, whose persistence in the pursuit of truth has evoked the admiration even of those who most differ from him. Now since Freud is a name which probably has for most of this assembly a significance which differs from that which it has for me, a few words of explanation are indicated. Freud's investigations, originally confined to abnormal mental conditions, led him to the view that the root of the abnormality lay in a struggle between two forces—namely, the instinctive impulses and the repressive forces. The idea of mental conflict is the basis of all Freudian psychology. As the result of this conflict experience based on instinctive impulses, or rather on impulses associated with the primitive instincts, unless converted into other channels, frequently comes to be buried or repressed owing to its incompatibility with social standards, and Freud postulated a new region of the mind, termed "the unconscious," which serves as a sort of reservoir for all experience thus repressed. By the term "the unconscious" we denote all experience which cannot be brought into the field of consciousness by any of the *ordinary* methods of memory or association.[9] Further, the content of the unconscious is essentially affective or emotional in character, and although buried, it continues to exert an influence on the conscious. The content of the unconscious can, however, be brought into the field of consciousness under certain conditions—namely, in dreams, in hypnotic states, and by Freud's particular method of free-association or psycho-analysis. It is well known that Freud, as a result of his investigations, was led to the conclusion that the great bulk of repressed experience was connected with the sexual instinct. This conclusion has failed to find anything like universal acceptance, but Freud's claim to fame does not rest on his interpretations, but rather on the new conceptions which he has advanced concerning the *mechanisms* of mental activities, as I have briefly sketched them. These conceptions will in all likelihood share one day the fate of many other theories, but for the present they provide a consistent working hypothesis which has already stimulated psychological inquiry to a quite remarkable degree. For these reasons it is preferable to make use of them, rather than reject them because in certain hands they "have sometimes led to the discovery of unpleasant aspects of human nature or because they come from Vienna."[8]

THE COMPARATIVE OR BIOLOGICAL METHOD.

The Freudian psychology is, however, open to one important criticism, especially when it is applied, as its adherents are now applying it, to normal behaviour, and the criticism is that its point of view is essentially human and ignores biological considerations. It recognises the evolution of the adult from the child, but is silent concerning the evolution of the species. The comparative or biological method is naturally free from this objection, and is the one along which I particularly wish to direct your thoughts to-day. While free to make use of the mechanisms of mental processes as enunciated by Freud, its outlook is far wider and embraces the whole range of animal life. In its study of man the comparative method adopts the point of view that man as a solitary animal is unknown, that he is not completely free to act as his individual fancy dictates, but is subject to certain instinctive influences, some of them common to all animals and to others that are not.

As you are doubtless aware, it is not always easy satisfactorily to differentiate between instinct and intelligence. Instinct is innate and independent of experience, whereas intelligence is acquired in the light of experience. But in any intelligent behaviour it is often difficult to exclude innate factors, while conversely it is difficult, especially in those animals, such as man, which are born in a state of great immaturity, to exclude individual experience however instinctive their behaviour may appear to be. The instincts common to all animals, or primitive instincts, are two in number.[8] First is the instinct of self-preservation, which can be subdivided into (*a*) the purely appetitive instincts underlying nutrition with their corresponding affective states of hunger and thirst, attraction towards the useful and repulsion towards the harmful, and (*b*) the danger instincts, with their various modes of reaction such as flight and aggression. The second is the reproductive instinct, again divisible into (*a*) the purely appetitive, and (*b*) the parental instinct; with this we are not concerned to-day.

Now it is important to observe that all instinctive reactions are accompanied by *feeling*, in such a way that the emotions may be regarded as the affective aspect of instinctive reactions. For example, the primary states of pleasure and pain are the psychical accompaniments of the fundamental reactions of attraction towards the useful and repulsion towards the harmful. Similarly the reproductive instinct is associated with the emotion of love and passion, and in its parental aspect with the tender emotion, especially that of the mother towards her young. Again, in respect of the instinct of self-preservation we find the emotion of fear associated with reaction to danger by flight and the emotion of anger with reaction to danger by aggression. These emotions, moreover, are exceptionally powerful, as evidenced by the conduct of the animal when completely under their influence and by the gross physical alterations which they effect. The common phrases "half dead with fear" and "beside oneself with anger" bear ready witness to these facts. From the biological point of view we are justified in regarding these emotional states as being purposive, in so far as they tend to reinforce the instinctive reaction. Thus not only does the tiger,

when cornered, fight with greater vigour because he is angry, but, in addition, the physical changes associated with anger, by increasing the blood-supply to the brain and muscles, render him more efficient. Correspondingly in those animals whose normal reaction to danger is by flight, fear reinforces the instinct and renders their flight prompt and successful. The same is, of course, true of the sexual instinct, as evidenced by the ferocity and restless activity of the male in the breeding season, and by the vigour, I had almost said courage, displayed by the mother in defence of her young.

THE GREGARIOUS INSTINCT.

In addition to the two primitive instincts we can recognise a third instinct—namely, the social instinct, through the agency of which cohesion is maintained in the herd, or group, or society. This is often called the gregarious instinct, under the influence of which the individual members of the group unite in common action for furthering the welfare of the group.† Three types of gregariousness can be identified, the aggressive as exemplified by the wolf pack, the defensive as exemplified by the sheep, and the socialised as exemplified by such varied species as the worker bee, the penguin, and man. Gregariousness, then, is not a modern or superficial condition, but a very old and fundamental one, and has certain distinguishing features. The first of these is the preference shown for companionship and the feeling of comfort and security derived therefrom. The second feature is the homogeneity of the herd or group; this is attributable to the suggestibility of its component members and to their specific sensitiveness to suggestions which come from the herd. The obvious effect of these conditions is to ensure that each individual shall conform to the behaviour of his fellows and shall show preference for herd opinions as opposed to any others. They are evidently not the conditions to encourage originality. The sensitiveness of the herd is well seen in the sheep in the rapid but silent manner in which the approach of danger is communicated to the flock. Now the sheep is a timid animal that reacts to danger by flight, and its timidity, together with the sensitiveness of its individual members which allows of the rapid communication within the herd of the approach of danger, represents a mechanism for defence. Similar suggestibility and sensitiveness are manifested in aggressive societies such as that of the wolf and dog by the howling of the pack and "the cry of the hounds." Thirdly, the gregarious animal is susceptible to leadership, provided that the leadership is for the good of the herd as judged by herd opinion. In other words, there is a submissiveness of the individual within the herd and a resistiveness of the herd itself to individuality. Fourthly, in in all gregarious animals we have to recognise the existence of what has been called herd impulse, by which is denoted a force which is capable of endowing outside influences with the energy of instinct and of conferring instinctive sanction both to beliefs and action. This surely is the idea underlying Montaigne's aphorism: "Custom is a second nature and no less powerful." The primitive instincts, then, of self-preservation and reproduction control from within and the herd instinct from without, and in the latter we can already identify the germs of what *we* call public opinion. It will further be evident that the gregarious instinct must at times be opposed to the more primitive instincts and so introduces a factor which promotes mental conflict. In many respects, however, it reinforces the primitive instincts and facilitates the performance of their reactions.

Man differs from the infra-human animals not in being devoid of instinctive feeling, but in having a larger intelligence which permits him to respond in so great a variety of ways that the instinctive character of his actions is often not obvious in his behaviour. He has further acquired the capacity to divert the energy arising from instinctive impulses into other channels, artistic, æsthetic, athletic, and so on, and has developed within the herd an individuality which tends to increase with every advance of his civilisation. In spite, however, of his greater individuality and increasing freedom within the herd, it remains a mistake to regard man as fundamentally independent of his biological history, however pleasant this view may be to the intellectualist; and seeing that man's personality is incomplete apart from the herd, it follows that human psychology must always be the psychology of associated man, for man as a solitary animal is unknown.

THE INFLUENCE OF HERD INSTINCT ON HUMAN BEHAVIOUR.

The evidence that man is gregarious is overwhelming, and the influence exerted by herd instinct on human behaviour is manifested in many directions. His intolerance of solitude, for example, both physical and mental, is seen in his desire for companionship and is reflected in the proverb "Out of sight, out of mind." It is further responsible for his hesitation in advancing new opinions, for the chilly reception which he accords them, and for his reserved and somewhat belated recognition of the courage displayed by those who insist on maintaining them. His relations with his fellows are dependent upon their recognition of him as a member of the herd, and the formalities subserving mutual recognition are correspondingly important while the strictest observance is enjoined in their performance. These formalities, moreover, whether it is the hand-shake, the raising of the hat, or the salute, are comparable to those employed by other gregarious animals such as the dog, however much the intellectualist may strive to confuse their identity. It would even appear that speech was primarily introduced to subserve mutual recognition rather than exchange of ideas, and it is noteworthy that ordinary conversation is largely confined to subjects of common interest to the herd, such as the weather, or the morning news which everybody has read. Another prominent feature of man's gregariousness is his suggestibility and his greater sensitiveness to the voice of the herd than to any other influence. Feeling is dominated by herd opinion, and reason cannot enforce belief against herd suggestion; experience before it is accepted must meet with herd approval, and this again leads to delay and hesitation in acceptance. Consequently we find that settled opinions, many of them irrational, are characteristic of the societies, classes, and cliques of which the modern herd is composed, but the force with which such opinions are endowed by herd impulse more than compensates for their irrationalism and for the slender knowledge on which they are based. We derive much comfort from certitude, and are easily deceived by custom. The truth of these statements is obvious when we realise the enormous import of the expression "bad form," and our irresistible tendency to "lay down the law" and express confident opinions on subjects concerning which our ignorance may be complete. There is a wealth of meaning in the Gilbertian lyric—

> "Every boy and every girl that's born into the world alive
> Is either a little Liberal or else a little Conservative."[11]

It is owing to somewhat similar considerations that the most satisfied members of the herd are often the most dull, for they attain mental certitude and comfort by implicit obedience to the voice of the herd and by an indifference to experience amounting almost to hostility. In this class are to be found the more reactionary elements, who nevertheless take pains to invite compassion by the use of some such idealistic title as "Die Hards." Compare, too, the readiness with which the herd entrusts authority to the orthodox and the old, to those in fact who, timid of novelty and shunning the enthusiasms of youth, "do nothing in particular, and do it very well."[11] "Men of age object too much, consult too long, adventure too little, repent too soon, and seldom drive business home to the full period, but content themselves with a mediocrity of success."[12]

† In the following pages the views elaborated by Trotter have been closely and often literally followed. (Vide ref. 9.)

THE UNCONVENTIONAL TYPE.

But besides the "stable," or resistive class, with its orderly, stereotyped habit of mind, there is to be found in modern society, and in ever-increasing numbers, a diametrically opposite one, whose energy, enthusiasm, unorthodoxy, and instability are derived largely from their incapacity to assimilate unwelcome experience by the simple process of false rationalisation and indifference. Moreover, it is on the presence in the herd of the unconventional that progress largely depends, and an illuminating feature of the war and post-war period has been the increasing tolerance manifested by the community to the activities of what in the broadest possible sense may be called the unstable. In the past these individuals, pioneers and extremists, have paid the heaviest penalties for their preference for originality and ideals rather than for herd opinion, and have faced with dauntless heroism the dungeon, the rack, the scaffold, and the stake. With their larger perspective so often opposed to the more limited outlook of the herd, they lack the mental comfort which characterises the "stable," and their capacity for brilliance of conception and boldness of execution is seriously handicapped by their erratic disposition and greater proneness to fatigue. Any discussion on courage must be incomplete unless attention is drawn to these facts, for during the war we were witnesses of the spectacle of individuals of the most varied temperaments and upbringing being brought into an atmosphere wholly foreign to their natures, and displaying evidences of courage and endurance at a cost to themselves which it was often difficult to understand and almost impossible to estimate.

Further evidence of the gregariousness of man is to be found in his increased susceptibility to leadership in war—i.e., when the whole herd is threatened: the tremendous influence exerted by Lord Kitchener provides a recent example of this. It would also appear that the wide and traditional acceptance of the analogy so often drawn between Christ and His Church and a shepherd and his flock bears testimony to the same characteristic of human society.

PUBLIC OPINION.

These various evidences of gregariousness in man may appear to have little to do with the subject of this lecture. Attention is directed to them, however, in order to emphasise the enormous importance of herd instinct in the influence which it has exerted throughout the whole history of man, and is exerting at the present time. I now pass on to consider another element of gregariousness to which brief allusion has already been made under the name of public opinion. We have learnt enough of herd instinct to realise without further elaboration that the origin of our moral codes is to be found in herd opinion. In the rites and solemn ceremonies of primitive man we can detect the germs of modern conventions, sanctions, and laws, and the energy imported to these by herd impulse explains the almost unlimited power which lies behind them. Moreover, seeing that in gregarious animals below man the welfare of the individual is subordinated to that of the herd, it is impossible to avoid the conclusion that altruism is a product of the gregarious habit, and must therefore be regarded as being just as natural as any other instinct.[13] It has been computed, for example, that the average worker bee, deaf to all voices other than that of the hive, works herself to death in about two months; she does it, moreover, with exuberant energy and every appearance of joyfulness, a little fire ablaze with altruistic feeling and unselfish enthusiasm.[9] Again, the dog, accustomed originally to obey the voice of the pack and now subservient to a human master, will spontaneously return to his master to receive the punishment he knows he has merited with every appearance of guilt. Herd instinct, in fact, introduces a mechanism by which the sanctions of instinct are conferred upon acts by no means acceptable to the body or mind, a mechanism in which originates the sense of duty, conflicting often with the more primitive instincts of self-preservation and reproduction. According to this argument, it is a mistake to regard man as an intrusion into the world, fundamentally independent, splendidly isolated, divorced from history, responsible to himself alone; on the contrary, it is far more rational to regard not only the bad but also the good elements of man's behaviour as products in no small measure of his development. However complex his behaviour, however obscure his motives, man is sensitive to the call of duty, of love, and of honour, altruistic, generous, and courageous not because reason recommends it, but because he must be.[9]

MECHANISMS TO ENSURE SAFETY.

Let us pause for a moment and take stock of the views we have attempted to formulate. It has been pointed out that the psychology of man is largely determined by his biological history, and that his conduct, being largely instinctive, is open to generalisation to a far greater extent than is sometimes supposed. In addition to the primitive instincts, man, like many other animals, is subject to herd instinct, modifying, and often conflicting with, the former, while both frequently conflict with experience. It has further been emphasised that the instincts are associated with various emotional states which serve to enhance interest and facilitate the successful accomplishment of instinctive reactions. We have seen, also, that altruism is an essential product of the gregarious instinct and that in the energy derived from herd opinion we can identify the germs of the moral codes by which human society is governed and controlled. Seeing, therefore, that the welfare of the herd predominates, it is not surprising that mechanisms have been evolved to ensure its safety. One such mechanism, I submit, is courage, which though called by that name only where man is concerned is not wholly unrepresented in animals. Owing to his greater intelligence and broader outlook, man can not only respond to any threatening situation in a variety of ways, but also has a far greater variety of threatening situations to respond to. Consequently the scope for the display of courageous qualities is enormously increased in man, so that we recognise beside physical courage, the courage we call moral, manifested in the field of art, of politics, of religion, and commerce. Moreover, owing to the greater individuality of man, entailing wide differences in adaptation, it happens that our mode of response to the same set of circumstances is subject to wide individual variations. So, too, there is a curious specificity about courage, as seen from the fact that a woman may present a bold front to a burglar and flee in terror from a mouse. "There is a courage of the Cabinet as well as a courage of the field; a courage which enables one man to speak masterly to a hostile company, whilst another who can easily face a cannon's mouth dare not open his own."[1]

"PURE" COURAGE.

If now we review the forms of courage previously alluded to in the light of what has been learnt, it is easy to understand that "pure" courage represents the perfection of the psychological processes which have as their object the successful response to danger. Here fear, the presence of which in anything like an acute form would inevitably interfere with the response, is completely suppressed by a process which is wholly unconscious, and the individual, or unit, is free to deal with the situation calmly and unperturbed. It has recently been suggested [8] that man's normal mode of reaction to danger is by manipulative activity, and that if his freedom of action is interfered with fear tends to obtrude into consciousness. This view finds support in the universal experience that trench warfare against an unseen enemy is infinitely more trying than a war of movement. Another form of courage is that in which the emotion of fear is replaced by some other affective state, of which anger is the most common, but by no means the only one. This form of courage admirably illustrates the complexity of man's behaviour, for the emotional forces which underlie it may be of the most varied kinds, such as

love of notoriety, covetousness, personal pride, religious enthusiasm, and so on. This aspect of courage in a recent article in the *Times* has been quite inappropriately termed the "courage of ignorance." In contrast with these two forms of courage which we may call the courage of fearlessness, there is the courage despite the presence of fear, or the courage of fearfulness. Here the enormous power wielded by herd opinion, in the shape of an *instinctive* sense of duty, comes into play, and ensures that the unit, be it XI. or XV., regiment or squadron, class, or nation, shall not be jeopardised by the frailty of its individual components. Was there not once a Spartan boy, who to escape the disgrace of being branded a thief permitted the fox which he had stolen and concealed under his tunic to gnaw into his entrails? "I can well die but I cannot afford to misbehave."[1]

COURAGE AND MENTAL HEALTH.

Human courage, then, in all its forms, may be regarded as a defence-mechanism of great complexity and great efficiency, and the universal esteem in which it is held, by conferring upon it the force and energy of herd instinct, adds enormously to its usefulness to the community. The efficiency of this mechanism is subject to the rules which modify mental health in general, for courage may be properly regarded as evidence of the existence of mental health. Now health of mind depends on the presence of a state of equilibrium between instinctive tendencies and the forces by which they are controlled. Weakening of the latter from whatever cause leads to the development of various abnormal states, the character of which largely depends on the particular "make-up" of the individual affected. The most frequent cause of weakening of the controlling forces is undoubtedly fatigue, the result of long-continued stress and strain, loss of sleep, exposure, and so on. In the air an additional factor is operative—namely, the defective oxygenation of the blood, and consequently of the brain, which occurs at high altitudes. During the war the conclusion was repeatedly forced upon me that courage and morale tend to evaporate at high altitudes, and I believe it was owing to this that relatively few decisive combats were fought at the greater heights to which your machines could attain. Under conditions of stress the normal controlling mechanisms become weakened, and fear which had hitherto been completely suppressed, gradually obtrudes into consciousness. This at once introduces an element of conflict, since fear, owing to its incompatibility with social standards is regarded with shame, and its further intrusion has to be resisted at all costs. Thus begins the process of *conscious* repression which in many cases is successful in restoring the normal mechanisms. In others, however, and especially when the conditions of stress persist, conscious repression fails in its object, and a state of anxiety, with its attendant physical and mental maifestations, gradually supervenes.[8] The development of such anxiety states is essentially due to fatigue of the higher controlling mechanisms. Now fatigability is a characteristic of all living things and its natural remedy is rest, and it is important to recognise that alternating periods of activity and rest are merely illustrations of the rhythmicity which pervades all life, as evidenced by the seasons of the year, the ebb and flow of the sea, the beat of the heart, and the states of asleep and awake. "To everything there is a season and a time to every purpose under the heaven; a time to be born and a time to die, a time to break down and a time to build up."[14]

THE OBJECT OF MILITARY TRAINING.

The more military applications of these various considerations are obvious from the fact that the essential object of military training is to establish morale and enhance the homogeneity of the herd. This is effected in various ways. Your leaders, generally speaking, have been recruited from a class in which respect for tradition and custom figure prominently: accustomed to rule as lords of the land, they have been wont to indulge their leisure in vigorous and dangerous sports and pursuits, and to cultivate the spirit of adventure under a strict, if somewhat inelastic, code of class discipline. Drill, again, encourages responsiveness and increases the awareness of each individual of what is passing in the minds of his companions. In addition to the processes of habituation and heightened suggestibility which characterise regimental life and lead to cohesion, morale is further strengthened by the wise and systematic use of sublimation. By this term is denoted the process in which the energy arising out of conflict is diverted from some channel which leads in an asocial or antisocial direction, and turned into one leading to an end connected with the higher ideals of society.[5] This is the significance of esprit de corps, pride of regiment, belief in a cause, and, in fact, of all those influences by which a soldier is encouraged to set so high a value on his duty towards his comrades that he is ready to die in its execution.

> "We would not die in that man's company
> That fears his fellowship to die with us."[15]

The innumerable manifestations of courage and endurance exhibited during the war were only rendered possible by this spirit of comradeship, and in this and in the use of mass attacks we recognise unmistakable evidences of gregariousness. A further instance of the heightened suggestibility of the well-trained soldier is to be found in the contagiousness of courage; it is "caught as men take diseases one of another"[16]; and may rapidly infect a whole army. There are, I think, indications at the present time that those responsible for military training in this country, without in any way losing sight of the inestimable importance of all those factors which make for disciplined cohesion, are more inclined than they have been in the past to pay attention to the psychology of the individual soldier. This question is of particular significance in a force such as yours, where, from the very nature of your duties, individualism must always be more prominent than in other branches of the Service. It is at any rate certain that responsiveness and automatic obedience to orders can be overdone. "The success of the Captain of Koepenick, for example, could only be possible in an army whose members had, through a special course of training, reached such a pitch of responsiveness to the commands of men in uniform that they obeyed without question the ludicrous orders of a cobbler."[8]

CONCLUSION.

In this study of the psychology of courage I have attempted to expose the fallacies inseparable from the purely intellectualistic method, and the limitations imposed by a view which regards courage as the sole prerogative of man. Especially is the wide divergence of opinion as to the type of individual, or class, likely to exhibit courage to be explained by the fact that courage has been too often regarded as an isolated quality of isolated man, while the motives underlying it have been consistently ignored, presumably because they are sometimes unsatisfactory. I would ask you once more not to be misled into thinking that courage loses anything of beauty or nobility because evidences of its existence are to be found in animals lower, much lower, than ourselves. It cannot surely handicap a young soldier to know that the seeds of courage have been sown in him by Nature? We have to be courageous or fail in our struggle for supremacy. For nearly three years of war I was permitted by a fortunate chance and the kind indulgence of my superior officers to be a safe, yet intimate, witness of many of those acts of irreproachable courage which stand to the credit of your Service; so close an insight into the mysteries of courage only served to enhance my admiration and arouse my curiosity. But curiosity as to its nature will never prevent us from idealising courage. Courage, from whatever angle we approach it, whatever origin or purpose we assign to it, no matter what form it assumes, nor even what motives underlie it, will always be a quality beloved of man. The courage of attack, the

courage of defence, the courage of art, the courage of debate, the courage of motherhood, the courage of grief, the courage of adventure, the courage of ill-health, the courage of the martyr, the gambler, and the spy, each for itself we respect and admire. And, after all, "it is not life that matters, but the courage that we bring to it."

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Three Lectures

ON THE

CULTIVATION OF TISSUES AND TUMOURS IN VITRO.

Delivered at University College, London,

BY A. H. DREW, D.Sc.,

IMPERIAL CANCER RESEARCH FUND.

LECTURE I.*

(Delivered on Feb. 28th, 1923.)

THE TECHNIQUE OF TISSUE CULTURE.

IN this course of lectures I propose to deal with the cultivation of tissues in media under three separate headings. In this, the first lecture, we shall have to consider the subject from what is perhaps its least interesting aspect—viz., the technique which it is necessary to adopt in order to obtain cultures, and having obtained them to keep them growing continuously in subculture. In the second lecture I propose to deal with the question of the growth of normal tissues in vitro, and in the third and last lecture to discuss the application of the method to cancer research and to consider some of the results obtained from a study of cultures of tumours in different media.

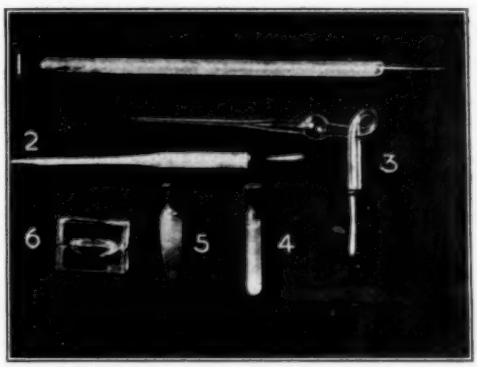
THE PLASMA MEDIUM.

Although in the past many different media have been tried with greater or less success, the only two which have proved to be really successful are a plasma medium and a saline medium recently devised. It will be necessary, therefore, to consider the best methods for obtaining plasma, and the preparation of the saline medium. Although in America chicken plasma has been more used than any other and chicken tissues chiefly studied, I propose to discuss the growth of mammalian plasma. One of the most convenient animals for such a purpose is the rat, which gives a good yield of plasma, in which grow readily not only rat tissues, but those of the mouse, guinea-pig, and rabbit, and doubtless many others.

Rat Plasma.

In order to prepare plasma from such an animal as the rat a number of instruments are required in the following order. Three or four pairs of sterile forceps, two pairs of stout scissors, and a pair of bone-cutting forceps. A long glass tube, about 5 mm. in bore, into one end of which is fused a stout, hollow platinum needle. This tube is coated with a mixture of hard and soft paraffin, by being immersed in a deep vessel containing equal parts of paraffin melting at 45° and 58° C. The tube is withdrawn from the molten mixture and quickly drained, care being taken to see that the needle is not choked. The tube is stored till required in a copper vessel, which is cooled by a mixture of ice and salt. Three or four ordinary Pasteur pipettes are coated with paraffin and cooled in the same manner as the needle. Two or three centrifuge tubes are also paraffin-coated and cooled, and a few small test-tubes treated in the same manner. (Fig. 1.)

FIG. 1.



1. Platinum needle fused into glass tube and coated with paraffin, for obtaining blood from heart. 2. Paraffined Pasteur pipette for plasma. 3. Right-angled pipette for saline medium. 4. Paraffined tube for storing plasma. 5 Paraffined centrifuge tube for plasma. 6. Glass capsules for storage of tissues.

The rat is anæsthetised with ether, pinned out, and the thorax opened aseptically. The heart is exposed and steadied with forceps, and the platinum needle plunged into one of the ventricles. The blood is allowed to flow into the tube till the flow slackens, when the tube is withdrawn and the contents are at once run into the centrifuge tubes, which are ice-cold. These are placed in the buckets of a centrifuge and the blood at once centrifuged at high speed for three minutes. The clear supernatant fluid is pipetted off with a cold paraffined Pasteur pipette into a second centrifuge tube, and the plasma again rapidly centrifuged for one minute. With a paraffined pipette some three-quarters of the supernatant fluid is pipetted off into a small paraffined test-tube, which is at once placed in a copper vessel surrounded with ice and salt, where it remains till required. Such a plasma, although it will give limited growth of embryonic tissues for a few generations, is not suitable for continued cultivation, for which the addition of an embryonic extract is necessary.

Embryo Extract.

Young embryos of the rat or mouse are taken at about the twelfth day. The parent is anæsthetised and the abdomen opened with aseptic precautions. The embryos are removed and are placed in a sterile Petri dish and covered with Locke's solution. They are next removed from the membranes and washed in another dish with Locke. They are next cut up with sterile scissors into coarse fragments, and the fragments transferred to several changes of Locke to free them from blood. This is essential, as more than minimal traces of blood inhibit growth. As soon as all obvious traces of blood have been removed, the embryo fragments are placed in a small tumour mincer (Fig. 2) and are finely minced. The pulp is transferred to a sterile tube and an equal volume of Locke's solution added, and the mixture is well shaken. It is then frozen and thawed twice to disintegrate the cells, and centrifuged at high speed for 15 minutes. The clear fluid is pipetted off and constitutes embryo extract. As an additional

* Lectures II. and III. will appear in coming issues of THE LANCET.

precaution the extract may be filtered through a Berkefeld filter.

THE SALINE MEDIUM.

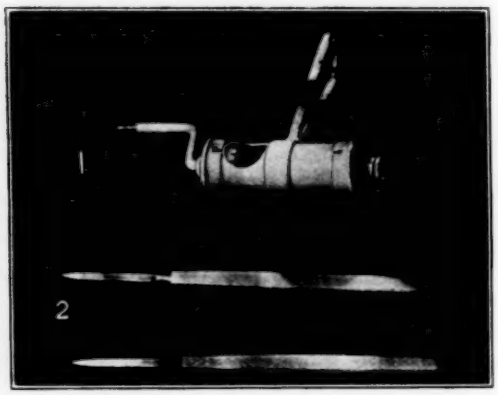
With the saline medium no plasma is required, but the addition of embryo extract is necessary. The saline medium has the following composition :—

Saline Constituents of Medium.

NaCl	0·900	$CaH_4(PO_4)_2$	0·010
KCl	0·042	$MgHPO_4$	0·010
$NaHCO_3$	0·020	H_2O	100·0
$CaCl_2$	0·020		

In actual practice it has been found convenient to make up the six saline solutions separately, and of ten times the final strength. The magnesium salt is not soluble, but if it be suspended and steamed with the other salts, solution takes place. These solutions can be kept in stoppered bottles, and when required aliquot quantities can be pipetted off into a flask, and sufficient distilled water added to give the requisite concentration. A complication is introduced by the necessity of steaming each of the two calcium solutions, and the sodium bicarbonate solution separately from the other saline members of the final solution; unless this be done no growth will take place. To make up 50 c.cm. of culture solution 5 c.cm. of each of the solutions of sodium chloride,

FIG. 2.



1. Mincer for mixing embryos for the preparation of embryonic extract. 2. Knives for cutting up tissues.

potassium chloride, and magnesium hydrogen phosphate is added to 20 c.cm. of distilled water in a small flask. This mixture, the two calcium solutions, and the sodium bicarbonate solution are then steamed separately for ten minutes. When all these have cooled, 5 c.cm. of each of the calcium solutions and 5 c.cm. of the sodium bicarbonate solution are added and the salt mixture is ready for use. In order to use either the plasm medium or the saline fluid, embryo extract is necessary, and for general use we find the best strength to be about one part of the embryo extract to four of plasma or of saline.

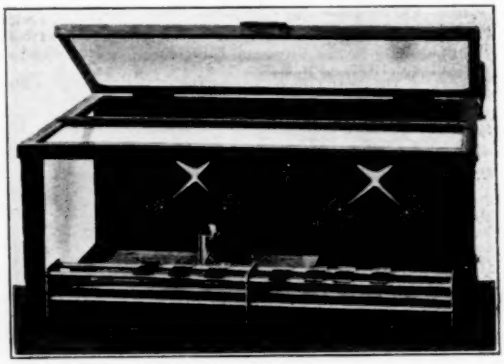
PREPARATION OF TISSUES FOR CULTURE.

A pregnant rat or mouse is selected and the abdomen opened with strict aseptic precautions. The embryos are removed and placed in a sterile, covered dish and covered with Locke's solution. With fresh sterile instruments the embryos are removed from the membranes, and whatever organ is desired to cultivate is removed and transferred to a capsule containing some of the saline culture medium. The organ is cut into coarse pieces and washed in several changes of saline, so as to free it as completely as possible from all traces of blood, which exerts a definitely inhibitory effect on growth. The washed pieces should then be transferred to a sterile capsule, kept moist by a few drops of the salt medium, and cut up with fine knives into small pieces about 1 mm. square.

Culturing.

Sterility is, of course, of the utmost importance in culturing tissues, and although all the operations yet described can be carried out with care in any ordinary laboratory, those now to be described must be performed under cover. For this purpose a metal and

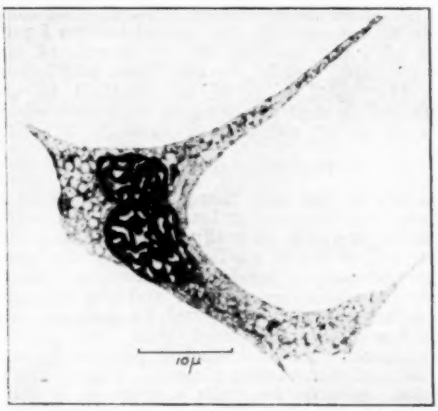
FIG. 3.



Box for putting up cultures with metal table for cover-glasses and rack for slides.

glass case, shown in Fig. 3, will be found very convenient. This case contains a glass rack for the hollow slides used and a metal table for the cover-glass. The whole apparatus is flamed out with a Bunsen and the metal table thoroughly heated. The slides, which are stored in absolute alcohol, are seized with forceps, rapidly flamed, and arranged on the glass rack. Cover-glasses are cleaned with chromic acid mixture and are washed and stored in ether. They are removed one by one with forceps, flamed, and laid on the metal table. In order to culture tissues in the plasma embryo extract medium portions of the tissue are transferred with iridectomy knives to the centre of cover-glasses. With a sterile

FIG. 4.



Amitotic division in cell induced by hypotonic fluid (commencement).

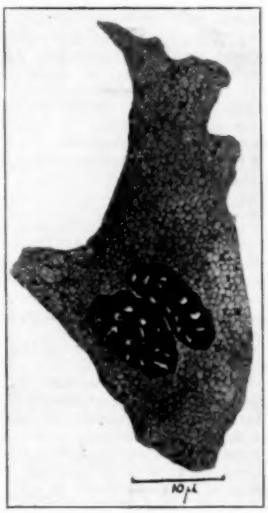
pipette a measured volume of the embryo extract is added to each and then three volumes of the plasma. The mixture is stirred rapidly with the knife, the fragments arranged, and allowed to clot. As soon as clotting has taken place the cover-glass is inverted over a well-slide and sealed up with paraffin. Cultures into the saline embryo extract medium are made in a like manner, except that the saline solution and the embryo extract are mixed first in a separate tube. A drop of the culture fluid is placed on the cover-glass,

and a portion of the tissue is carefully lowered into it and pressed down to the surface of the glass with the knives. This is essential, as if the fragments float little or no growth is obtained. The cover-glass is inverted on to a well-slide, which is then sealed. The slides should be kept in the incubator with the cover-glass downwards, at all events for the first 24 hours.

Subculturing.

This is performed differently, according to whether the culture medium is plasma or saline. In the case of plasma cultures the cover-glass is raised, and with a pair of iridectomy knives the margins of the growth are carefully cut through and the culture transferred to a capsule of Locke. After washing for two or three minutes the fragment is reimbedded in plasma-embryo extract medium. Should the amount of growth necessitate it, the culture may be divided into two or more fragments, each of which is then separately reimbedded in plasma. Where cultures are made in the saline medium, subculture is performed by pipetting off the original drop of fluid and adding fresh culture medium. At times, when the original fragment has grown too large, it may be carefully lifted with the edge of a sharp iridectomy knife and floated off on to a clean slide. Here it is divided, each portion being treated as a new fragment. Although primary cultures may be obtained in either medium without embryo extract, yet for continued culture this substance is absolutely necessary. The accompanying chart illustrates this fact. It will be seen that although an initial growth is obtained, and that this may continue for a few generations, growth gradually ceases and the culture finally dies out. Carrel has shown that without embryo extract the cells cannot utilise the food substances present in the medium. The nature of the substance or substances in embryonic extracts is unknown; they are, however,

FIG. 5.



Amitotic division in cell induced by hypotonic fluid (finish).

Chart showing (1) *Growth of Embryonic Tissues in Plasma and Medium only; and* (2) *in Plasma Medium with the Addition of Embryo Extract.*

(1)

† ††† †††* †† ††† †††* †† †* 0 (culture dead)

(2)

† ††† ††††* ††† ††††† ††††† ** †††† †††††† †††* †††† †††* ††††

* Indicates subculture.

destroyed by heat at 60° C. for half an hour. Growths obtained in either of the above media appear perfectly normal; thus heart cultures may show active beating, which continues from subculture to subculture. The mitotic figures which are obtained are quite normal in all respects. Alteration of the type of nuclear division may be readily induced, however, by using a very hypotonic medium. If this be done division appears to take place by amitosis, frequently (Figs. 4 and 5) no mitotic figures being seen at all. Such divisions are, however, of the nature of degenerations, as such a culture gradually dies out, even if frequently subcultured into fresh hypotonic medium. If, however, subculture be made into ordinary media, mitotic division recommences and the culture will live indefinitely. With regard to the interval that should elapse between successive subcultures, no general rule can be given and experience is the only reliable guide, but speaking generally actively growing tissues should be subcultured every three or four days, although when we come to consider tumour growth we shall find that this is not sufficient to avoid degeneration setting in.

Fixing and Staining.

No alteration of technique is necessary for fixation and staining of in vitro cultures. By far the best fixatives for cultures in saline media are Flemming or Bouin solution, whilst an alcohol-acetic acid fixative is generally preferable for plasma. In either case the cover-glass is removed from the slide and washed for five minutes in some Locke's solution, which is kept at 37° C.; this removes traces of serum, extract, &c., which mar the picture. The cover-glass is taken direct from the Locke solution immersed in the fixative in the usual manner. It is found, however, that usually the time of fixation may be reduced to 6 or 12 hours. For staining no stain can compare with the iron-hæmatoxylin of Heidenhain, though Ehrlich's hæmatoxylin, followed by eosin, yields good pictures.

SOME CONSIDERATIONS OF THE SACRO-ILIAC JOINT.

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THE sacro-iliac joint will be considered under the following headings: (1) Morphology, (2) gross anatomy, (3) movements, (4) the commoner pathological conditions of relaxation and strain.

Morphology.

In order to understand the mechanics of the sacro-iliac joint, it is necessary to make a brief comparison between the conditions obtaining in pelves of pronograde and orthograde animals.

In the pronograde:—

(*a*) The dorsal elements of the pelvic girdle articulate with the vertebral column at the sacro-iliac joint, the vertebral articular surface being composed of both the costal and transverse elements.

(*b*) The ventral elements of pubis and ischium both articulate by an elongated symphysis.

In the orthograde, through the formation of a lumbar lordosis, changes take place as follows:—

1. The articular surface, instead of being longer in the dorsi-ventral, becomes longer in the cranio-caudal direction.

2. A rotation of the sacrum takes place, the upper cranial end rotating backwards, the lower caudal forwards, so that the costal process element of the articulation is maintained, while the transverse process element is lost.

3. With the lengthening of the articular surfaces in the cranio-caudal direction more vertebræ figure in the articulation, so that instead of the one sacral vertebral contact of pronogrades, in the orthogrades the condition is arrived at of a 2 to 2¼ sacral vertebral contact in woman, and 2¼ to 3 in man, thus determining a sexual difference.

4. Hand in hand with this the symphyseal element, formed as was seen above in the pronograde of the pubic and ischial elements, opens up caudally; first, the ischia being entirely freed, next a partial separation of the pubic element occurring, until the typical human pubic symphysis is arrived at, which consists of only one-half of the original pubic portion.

Thus very briefly are seen some of the changes as they affect the sacro-iliac joint, though mention should be made of an intermediate stage which D. E. Derry[11] has shown to exist, in cases when, in spite of the assumption of the erect attitude, the

transverse process elements occasionally persist. He has described several specimens of ilia with post-auricular facets, one or two in number, in the form of prominences on the ilia, either passing to meet ligamentous attachments on the sacrum, or being actual facets articulating with the first, second, and third sacral vertebral transverse elements. This condition shows a transitional state of affairs between that in the pronograde and orthograde animals, the post-auricular facets being relics of the transverse process contact of the former.

In the maintenance of the erect attitude, the posterior portion of the iliac bones is drawn backwards and downwards by the pull of the gluteus maximus and hamstrings through the sacro-sciatic ligaments; so that a sharp sciatic notch is produced, though here again a sexual difference may be observed, for the female sciatic notch is not so sharply angled as the male. In this way it may be said that the female pelvis contains more of the horizontal pelvic characteristics than the male, in that—

(*a*) The sciatic notches are less sharply angled.
(*b*) The ilia are longer, less curved, and less backwardly bent.
(*c*) The sacral articular surfaces of the sacro-iliac joints represent only 2 to 2¼ sacral vertebræ.
(*d*) The body-weight being transmitted more through the front part of the first sacral vertebra, the anterior or cranial end of the sacrum tilts more forwards, the posterior or caudal more backwards, producing a movement known as nutation of the sacrum, which is a rotation through the second sacral vertebra.
(*e*) The presence of the pre-auricular groove, commoner in women. Derry[11] says: "In diarthrodial joints the amount of grooving or constriction of the bones forming that joint for the attachment of ligaments is in direct proportion to the amount of movement thereat—e.g., the head of the femur moving on the fixed acetabulum is the more grooved for capsular attachment, or the condyle of the jaw in the immovable glenoid fossa, similarly."

So with the sacro-iliac joint, the female ilium moves on the more immovable sacrum, and shows a grooving of the bone anteriorly, the so-called pre-auricular groove. Whereas on the male bones, where there is normally next to no movement of ilium on sacrum, owing to the amount of bony interlocking that takes place of both articular surfaces, no such groove is found.

Gross Anatomy.

The sacro-iliac joint is now classed as a diarthrosis, the bony elements being the auricular surfaces of the two bones, which are covered with cartilage that looks like hyaline, but proves histologically to be fibro-cartilage, that on the sacrum being the thicker and more fixed. It was not till Goldthwaite and Osgood[1] wrote their paper on these joints that much attention was focussed on them, and even now several text-books of anatomy have not gone out of their way to correct their old and erroneous statements.

The capsule of the joint is formed by the intrinsic ligaments which are too well known to need mention and is weakest inferiorly. That this is so is shown by the following points:—

1. Disease of the joint most often points this way.
2. In puerperal sepsis a path may be opened into the joint here.
3. Rupture of the joint takes place here, as, for example, after symphysiotomy and other such strains on the pelvic girdle; though a compensatory hypertrophy of the anterior ligaments sometimes takes place, for in cases of absence of the pubic symphysis full activity even to uncomplicated pregnancy has been recorded.
4. Frequent implication of the lumbo-sacral cord in pathological conditions of the joint, the cord being a constant relation of the lower third anteriorly, so that the irritation of it explains the sciatic and other pains so common in lesions of this joint.
5. Naked-eye inspection, when on moving the bones together the capsule is seen here to be thin and stretched; further pouches of synovial membrane bulge out quite readily along the anterior aspect of the joint.
6. From the weak markings of the bones anteriorly.

The synovial cavity, seen best by injection with coloured gelatin either beforehand or during dissection, is considerable in extent, extending posteriorly in small pockets behind the auricular surface the whole of the way down, or being encroached on posteriorly by the ligamentous fibres that go to form the inter-osseous ligament. Further, the laxity of it is shown by pressing the bony surfaces together when the membrane is seen to bulge in small pockets along the anterior aspect of the joint. Sections through the joint in a series of pelves, taken in a vertical and oblique direction, between corresponding points, show a definite sexual distinction, the male joint cavity being much more tortuous by reason of the bony interlocking, whereas the female is much less tortuous with very little interlocking, thus permitting greater freedom of movement. This was observed in a series of dissecting-room bodies—where naturally the joints showed considerable cartilage erosion, osteo-arthritis, and varying degrees of ankylosis—and further confirmed on post-mortem bodies.

Movements.

1. Careful study shows that the pelvic articulations are fashioned to make movement possible in certain directions, the function of such movement being to lessen jarring and straining. Stability is dependent on the tone and character of muscles and ligaments, and anything interfering with the stability of the pelvis interferes with the use and development of the muscles and ligaments attached.

(*a*) With regard to the pubic bones, the muscles give no support and the ligaments afford but little strength and stability. Further, as mentioned above, the pubic bones may be absent and full activity even to uncomplicated pregnancy ensue. What movement there is at the pubis, of up and down play, is only possible in so far as there is relaxation and movement at the sacro-iliac joint.

(*b*) At the sacro-iliac joint movement consists of a tilting of the ilium on the sacrum. Further, because of a double obliquity of the joint surfaces, a moving back of the upper part of the sacrum, which is wedge-shaped with the base of the wedge anterior, increases the antero-posterior diameter of the pelvic brim; also by pushing the ilia laterally, so increases the transverse diameter also. Owing to the "nutation" of the sacrum, increased inlet measurements of necessity coexist with diminished outlet diameters, changes that are produced by the assumption of the so-called Walcher's attitudes.

The first position shows the patient supine with the legs from the hips hanging free over the edge of the table, so producing hyperextension of the hip-joints with extreme tautening of the ilio-femoral ligaments, and also a forward rotation of the ilium on the sacrum so that the sacral promontory lies farther away from the symphysis. This movement is greatly aided by the physiological relaxation of the sacro-iliac joints during pregnancy, so contrasting with the lack of movement in the corresponding joints in the male. In the second position the thighs are sharply flexed on the abdomen, when the inlet measurements are decreased and those of the outlet increased.

It is well known that at the close of pregnancy great hypertrophy of the symphyseal ligaments takes place in the guinea-pig's pelvis, to allow the pubic bones to separate to the relatively wide interval of one inch; further, at the same time a relaxation of the capsule of the sacro-iliac joint occurs, a state of affairs that incapacitates the guinea-pig so much that during the last three weeks before labour she crawls on her abdomen dragging her femora behind her. This happens because the separation of the pubic bones allows the abdominal contents to fall forwards, and owing to the consequent flattening of the ilium, sacrum, and coccyx, as Sir John Bland-Sutton has pointed out, the leverage power of the femora is weakened. After parturition the symphyseal ligaments quickly return to their former state, though the symphysis does not regain its firmness, for in a macerated parous specimen the pubic bones fly apart. It was hoped that from a study of a series of guinea-pigs, pregnant and non-pregnant, before and after labour, some help might be obtained towards the understanding of the similar but less marked relaxation that takes place in the sacro-iliac capsules in human pelves: beyond verifying the condition found by dissection, histological evidence of the gradual hypertrophy and sudden return to normal of the symphyseal ligaments is most disappointing.

2. In this way it is seen that the chief influences that bear on the sacro-iliac joints and their movements are as follows:—

(*a*) *Sex.*—The articular interlocking precludes in the male any but a slight movement, whereas in the female the absence of interlocking and the physiological relaxation during menstruation and pregnancy, help to provide a distinct though limited range of movement.

(*b*) *Certain Unusual Anatomical Extrinsic Influences.*—(1) The post-auricular facets mentioned above; (2) an abnormal lumbo-sacral articulation, in which the fifth lumbar transverse process may articulate either unilaterally or bilaterally, with the ala of the sacrum postero-superiorly, or with the ilium above and behind the auricular surface, a state of affairs that will further restrict the joint movement.

(*c*) *Conditions Tending Towards the Pathological.*—These conditions, tending in their results toward the pathological—e.g., of occupation—were lucidly described in Sir Arbuthnot Lane's classical paper of 1887 on the skeleton of coal-heavers, bearing out his theory of the crystallisation of lines of force in the direction of stress and strain. Indeed, since the writings of Matthews Duncan and Arbuthnot Lane very little has been added to our knowledge of the mechanics of the bony skeleton.[12 13]

(*d*) *Maintenance of the Erect Attitude.*—The body-weight is transmitted vertically down through the first piece of the sacrum, causing a forward nutation of that bone, a movement resisted by (1) the pull of the sacro-sciatic ligaments inferiorly; (2) the posterior sacro-iliac ligaments of great strength, which, working, with the auricular articulating surfaces as a fulcrum, tend to force out either iliac bone, but only bending them out owing to the presence of the symphysis pubis in front; and (3) the upward and inward thrust of the femora. That this is so is shown by the production of the unilaterally deformed Nägele and bilaterally deformed Robert pelvis, brought about respectively when one or both sacro-iliac joints have lesions incapacitating their movements, so that the bones give to the upward and inward thrust of the femora and cave in.

The Commoner Pathological Conditions of Relaxation and Strain.

Relaxation arranges itself under three headings:—(1) The physiological relaxation associated with menstruation; (2) that associated with pregnancy, being an exaggeration of the normal physiological condition; (3) that due to trauma, general weakness, or some known pathological process in which various conditions predispose to joint trouble, as: (*a*) faulty postures, for example, standing in a position of extreme lordosis, or sitting with the lumbar curve reversed, as when lounging; (*b*) in stout persons with visceroptosis, the drag of the abdominal contents increases the lumbar lordosis; (*c*) the badly-fitting corset, again, increases the lordosis and presses on the iliac crests anteriorly. These conditions cause abnormal joint pressure and so through the stages of serous infiltration, enlargement of the synovial membrane, and separation of the bony surfaces, freer movement is produced in the direction of relaxation.

In Osgood's series only 2 per cent. showed absolute ankylosis of their pelvic joints, but he does not specify the ages of the subjects. Further, mention should be made, in the ætiological consideration of this condition, of rickets, cachexia, constitutional weakness, and functional nerve disorders, occurring most frequently in multiparous women, especially in those with occupations calling for much walking and carrying of weights.

The symptoms of this condition are very variable, ranging from slight pains in the sacro-iliac region to pains throughout the whole pelvis, unsteadiness of gait, and sometimes a complete disability.

Sacro-iliac strain may be of the following types:—

(*a*) *Subacute*, brought on by stooping. In this movement protection is first given by the contraction of the antagonistic muscles, next strain is instinctively relieved by hyper-extension of the lumbar spine—as will be remembered by those who have experience of long and arduous pulling in a forceps delivery, or in a tug-of-war when a wrong position has been maintained, or by pregnant women wearing too high heels, or, again, by faulty standing, or by lying supine on a hard surface. For example, post-operative backache is often caused by a patient, especially a woman, having been laid on an operating table with no support in the small of her back, so that the anæsthetic relaxation of the protective spinal muscles easily brings about such a condition. Milder degrees are often seen after ordinary recumbency, when a good stretch on waking relieves any lumbar pain that may be present.

(*b*) *Acute.* A patient complains that something has snapped, and of difficulty in holding his body erect, with sharp pain in the lower lumbar region. This pain disappears after a rest, then reappears and becomes worse after 24 hours, when the patient is completely disabled, and the pain which has been at first localised spreads through the whole lumbar region.

(*c*) *Chronic*, which falls more under the heading of joint relaxation, mentioned previously. In these conditions varying degrees of damage are done to the joint, ranging from a mild trauma to actual stretching and rupture of the ligaments, occasionally with some bony displacement and subluxation.

The symptomatology of sacro-iliac strain and relaxation may be—

1. Subjective:—

Pain may be localised in the joint, or owing to the proximity of the lumbo-sacral cord it may be referred to the leg or foot. It is increased by movements that affect the joint, but not by pressure along the nerves. Generally unilateral, the pain is worse at night owing to dorsal recumbency, and is relieved by changes of position—e.g., from the dorsal to the lateral. By day in some cases it may not be present unless the joints are strained by sitting, standing, stair-climbing, or stooping. Further, in women the pain is worse at menstruation.

2. Objective, found on clinical examination:—

(*a*) *Abnormal Mobility.*—This is observed in cases of joint relaxation (1) by forced hyperextension of the thighs one at a time, so moving the ilium on the sacrum; (2) again, with the patient standing and the observer holding one hand on the sacrum and the other on the pubis, if the patient now raises first one knee and then the other, abnormal mobility can be noted; (3) with the thumbs on the sacrum and the fingers on the crest of the ilia, when the patient is asked to raise her legs one at a time, abnormal mobility is found: for this test the patient is best placed sitting on a chair: (4) with the patient lying on her back and raising first one leg and then the other, extra mobility is elicited by the observer laying his hands flat on the sacrum.

(*b*) *Certain Abnormal Attitudes and Postures.*—As for example on standing, the body is inclined to the opposite side. On rising from the sitting posture the spine is held rigid and the hands are used for support. On stooping, flexion of the spine is avoided. On walking, in acute cases, the steps taken are short to avoid spasm of the hamstrings, and in chronic cases the gait may become rolling or waddling. On sitting the patient does so on the sound side to avoid the pain from using the diseased buttock.

(*c*) *Limitation of Movement.*—In movement of the body on the thighs, seen in forward, backward, and lateral bending; so that in extreme cases the last-named may be so curtailed that the body is drawn forwards, and the erect attitude avoided.

In this way the objective symptoms are seen to be abnormal mobility, abnormal attitudes and postures, and abnormal limitation of movements. Albee's symptom-complex [5] of sacro-iliac disturbance is as follows:—

1. Pain in the region of the affected joint on turning over when in the recumbent position.
2. Discomfort when lying on the back.
3. Pain when sitting on the affected buttock, relieved on changing to the opposite side.
4. Pain in the affected joint on forward bending.
5. Pain on deep pressure over the affected joint.
6. Listing of the whole spine to the side opposite the lesion.
7. Goldthwait's symptom, which is that pain is referred to the joint or to the leg of the affected side, when the thigh is flexed and the leg extended.

Finally, the danger of diagnosing over frequently sacro-iliac disturbance must be constantly kept in mind; for in a joint so difficult of access, diagnosis is very hard to confirm. As Payne[8] has said, great care must be taken to exclude other conditions before giving the sacro-iliac joint the blame for the manifold forms of lumbar discomfort and backache.

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OBSERVATIONS ON PEPTONE IMMUNISATION IN ASTHMA AND OTHER ALLERGIES.

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"PEPTONE" in this article represents the mixture of proteoses and peptones produced by digestion of protein. It is present practically constantly in the stomach or intestines. In the small intestine the proteoses, peptones, and polypeptides are resolved into amino-acids, which alone are admitted into the portal blood and are capable of detection by vividiffusion and other methods. No trace of peptone is discoverable in the portal blood, even after a heavy protein meal, and this is not surprising when it is considered that even such a minute quantity as 0·01 g., intravenously introduced, produces poisonous symptoms. Those amino-acids which pass the liver are quickly taken up by the tissue cells, and selected as building material for their own albumins. The cell also katalises its albumin to amino-acids, some of which are distributed by the blood to other tissues which may require them, such as the vital organs in cases of starvation, while others are excreted as waste matter. This katabolism is effected, just as in alimentary digestion, by two ferments; one pepsin-like, acting in acid medium producing the peptones and the other, erepsin-like, attacking the peptones in an alkaline medium to produce the amino-acids.

These remarks are rendered necessary in view of the assumption, still occasionally made, that peptone passes through the intestinal wall into the blood. Thus Widal, Abrami, and Iancovesco [1] have advanced this hypothesis on the ground that the "*crise hæmoclasique*" followed an Eck fistula, thus demonstrating that proteoses and peptones must have been present in the portal blood. Normally, they think these bodies are "fixed" by the liver, but if the liver is out of order, they are passed into the general circulation thus producing the "hæmoclasis"—an unfortunate expression, by the way, as it really means disruption of the red corpuscles, whereas the only constant effect of the phenomenon is a leucopenia. The fallacies underlying such a view are obvious enough. The portal blood may contain many substances, quite apart from peptone, capable of inducing the "*crise*," such as amines, which are normally transformed in the liver. According to van Leeuwen,[2] the so-called hæmoclasic crisis is a very ordinary affair which can be induced by all sorts of ingested substances, even carbohydrates. Zehnter [3] has recently adversely criticised the phenomenon as a sign of hepatic insufficiency, his results mainly contradicting it. If proteoses were circulating in Eck fistula dogs they would give the well-known reactions, whereas the animals either show no particular symptoms or else a state of excitement.

"*Digestive*" *Anaphylaxis.*

Here brief consideration may be given to another phenomenon, that of "digestive anaphylaxis" treated either by minute oral doses of the offending substance, or by the ingestion of 0·5 g. peptone an hour before meals on the empty stomach (Pagniez [4] and Vallery-Radot, Widal, Fatou [5]). It is affirmed that peptone so taken prevents the symptoms not only of indigestion, such as flatulence, somnolence, arrhythmia, and facial erythema (Fatou), but also urticaria, migraine, or asthma which may be excited by the digestive disturbance. This purely local action of peptone lasts for about three hours, and the dose must be repeated before the next meal. Now in view of what has previously been stated as to the abundance of peptone normally present in the stomach or alimentary canal, this method of treatment certainly looks like carrying coal to Newcastle. But the observations of Pavlov [6] have supplied the likely explanation. He showed that the chemical excitant of the gastric juice—the excitant of the hormone (gastrin)—was a constituent of the digestion of flesh. No other substance was capable of so acting though water had a slight effect. This constituent Pavlov found in peptone, especially a pure peptone such as Chapoteau's, as apart from proteose, so that when given before meals it creates a secretion of juice sufficient to protect the sensitive mucous membrane from the offending substance, and which in turn is more effectively digested. Extract of meat concentrated in a slowly dissolving medium is alleged by Pavlov to have an even more decided effect in producing the secretion, so that if given under similar conditions the results would doubtless be at any rate quite equal to those of peptone. Given during digestion also the hormone effect would doubtless ensue.

Immunisation by Peptone.

Immunisation by small increasing injections of peptone, avoiding apparent reaction, was based on experimental results of two kinds.[7] In one set it was shown by Dale that when an animal was sensitised, say to three antigens, desensitisation to all three might be effected by one of the antigens. Obviously, therefore, there were no chemoreceptors and two of the desensitisations were non-specific. Dale also found that in the case of an animal immunised to a particular serum, a strip of the uterine muscle was nevertheless sensitive not only to the homologous serum, but also to a heterologous one, either of which also desensitised to itself. The other set of experiments by Biedl and Kraus, Weil, and others showed that peptone poisoning produced in non-sensitised animals the distinctive symptoms and lesions produced by the exciting dose of the antigen in the corresponding sensitised animals. As the symptoms were always identical in the same species, no matter what the antigen, the poison is evidently non-specific; hence the power of one antigen to desensitise to several. This poison also is either contained in the peptone itself or else is produced by its reaction with the fluids and tissues of the body. Hence it might be inferred that treatment with peptone would produce in the blood a protective substance against this poison from whatever source.

Although we hear of "rival" theories of anaphylaxis—the humoral and the cellular—all the available evidence points to the correctness of Bordet's [8] view that both humoral and cellular factors can indisputably be proved, and any attempt to exclude one in favour of the other is bound to fail. The protein poison or anaphylatoxin is easily made by digesting normal serum with certain substances, as, for instance, agar, and as all the agar is recoverable, it is clear that the matrix of the poison is in the serum itself. When injected into the blood, anaphylatoxin quickly produces the symptoms of the anaphylactic shock; and the agar sol itself also, when injected in small quantity into the blood, produces identical symptoms. According to Bordet the agar acts by adsorbing some constituent from the serum which leaves it in a poisonous condition—i.e., containing anaphylatoxin. In anaphylactic shock, the antigen-antibody complex in like manner adsorbs this constituent from the blood or the cellular elements of the tissues. When immunisation or desensitisation is effected, a substance is produced which protects against the further action of the anaphylatoxin. We may call this substance anti-anaphylatoxin.

Cellular Reaction in Anaphylaxis.

Great importance was attributed by Weil to the cellular reaction in anaphylaxis, and he devised many ingenious experiments proving his contention. Dale further elaborated this point, and has consistently endeavoured to fortify the view that the shock is exclusively a cellular phenomenon, which, though imitated by the anaphylatoxin shock, is nevertheless of a different order. He believes, with Weil, that the antibody is precipitin which on uniting with the antigen produces a precipitate on or in the tissue cells, the resulting "colloidal disturbance" (aggregation)

sufficing to cause the shock, without the production of any particular poison. The somewhat paradoxical position is also maintained that when precipitin is present in considerable amount in the blood, it neutralises the antigen quietly, so preventing its access to the precipitin in the cells. When the circulating antibodies are reduced below a certain amount by their migration to the cells, shock occurs. Dale and Kellaway,[9] however, working with starch, agar (non-protein substances) and agar anaphylatoxin, obtained some very puzzling results. They found that the chief difference in guinea-pigs between anaphylactic shock and anaphylatoxin shock by starch anaphylatoxin or agar sol related to the condition of the blood platelets as regards numbers, aggregation, &c. But when starch anaphylatoxin or agar was injected into the sensitised guinea-pig, it reacted much more sharply than the normal pig, and the resultant shock was in no way distinguishable from specific shock. Now these results would seem to indicate that the discrepancies as regards the blood platelets, &c., were dependent on the degree to which the blood and cells respectively reacted and not to a difference in kind, as in the sensitised animal the cells have undergone a long preparation.

Precipitin Probably not the True Antibody in Anaphylactic Shock.

The practically constant occurrence of precipitin as one of the antibodies in infectious and other antigenic conditions, and its subsidiary rôle in the immunity process, render it improbable that it should form the true antibody in such a highly specialised syndrome as the anaphylactic shock. Weil,[10] for instance, found that the immune animal often contained an amount of circulating precipitin far too small to explain its immunity, and on the other hand, antigen might be present in the circulation together with large amounts of precipitin. Also the anaphylactic antibody does not react with antigen according to the laws of chemical combination, as after partial neutralisation of the antibody, the effective dose of antigen necessary to produce shock is enormously greater than that required by untreated antibody. It is difficult to reconcile this behaviour with the idea of a precipitate. Dale and Kellaway emphasise the fact that in the uterine muscle test, when precipitin is added to the bath, the response to the antigen is inhibited, and also that with anaphylatoxin the response is feeble, except possibly with agar anaphylatoxin. But Weil found that when excess *antigen* was added to the bath the response was inhibited, and we should hardly expect adventitious anaphylatoxin to produce an effect equal to that resulting from its generation within the cell itself. We also know that the uterine contraction has nothing specific about it, as it is given by histamine, &c., and it varies greatly in relation to the species of animal used, the dosage, ionisation, &c.

The above experiments were confined to guinea-pigs, but in recent experiments by Longcope [11] on the white rat it was impossible to produce anaphylactic shock. Neither uterine nor skin reactions were obtainable, nor could guinea-pigs be passively sensitised with the serum. Yet the rats formed abundance of precipitin and the antigen disappeared from the blood when the precipitins had reached their greatest concentration. The rats, however, reacted typically to peptone (anaphylatoxin). Longcope concludes that in this case the anaphylactic antibody cannot be precipitin.

Experiments with Peptone.

In 1921 Dale and Kellaway tried the effect of moderate doses (0·1 g.) of Witte's peptone intravenously in passively sensitised guinea-pigs, and obtained a definite protection against specific shock (unpublished). Dale suggested that the peptone might act by displacing the antibodies from the tissue cells into the blood, thus inhibiting the shock by neutralising the antigen in accordance with his views. But quite recently Kellaway,[12] in some very important experiments, found precisely the opposite to occur. Using actively sensitised guinea-pigs, he first tried them with fairly large doses intravenously of normal guinea-pig's serum, and found that the antibodies rapidly began to disappear from the blood, and very soon afterwards they began to disappear from the cells as well. In about two hours the antibodies had completely disappeared from both blood and cells when the animal was entirely refractory to the antigen. In two hours more the antibodies had practically all been restored to the cells, but it was over 20 hours before they were restored to the blood, during which interval the sensitiveness had returned. So far, therefore, the "cellular" theory was in evidence. (It may be as well to mention that "disappearance" here simply means lack of response and not that the antibody necessarily migrated or was destroyed.) Kellaway next tried Armour's peptone (No. 2)* in doses of 0·1 to 0·15 g. intravenously, and found it conferred a high degree of protection, the animals withstanding two or three lethal doses of the antigen. But the action of the peptone was entirely different from that of the serum. It reduced the circulating antibodies to about one-third, while it left the cellular antibody entirely untouched. This is a very remarkable result, and proves that the peptone endowed the body with a protective substance or quality and the inference is certainly justified that the protection was directed against the anaphylactic poison generated by the antigen-antibody complex) by the production of anti-anaphylatoxin. As regards the effect of normal serum, it is interesting to note that in poisoning by anaphylatoxin, Novy [13] and De Kruif on injecting normal serum also found a protective effect.

Colloidal Disturbance.

While the existence of anaphylatoxin is capable of direct proof, the purely physical factor of a colloidal disturbance and its supposed effects pertain to the realm of theory. What do we know of the behaviour of the colloids? The French call this disturbance of the colloidal equilibrium "colloidoclasia," a term which does duty very much after the manner of the blessed word "Mesopotamia." The conceptions which have prevailed as to the special behaviour of colloids as apart from crystalloids have recently been subjected to very drastic treatment in a remarkable work by Loeb,[14] which, on account of its importance and the attention it is receiving, may be briefly mentioned. Loeb endeavours to prove that proteins form ionisable salts with acids and alkalies according to the stoicheiometrical laws of crystalloid chemistry.† Protein being amphoteric, it behaves as a base when the H-ion concentration of the solution is above a certain value and as an acid when below that value, while at the critical value, the protein is at the iso-electric point and remains practically non-ionised. With the proof of this, the entire colloidal behaviour of protein solutions as to osmotic pressure, electric charges, &c., is solved on the Donnan principle of membrane equilibria, so-called from its discovery, thermodynamically, in 1911 by Prof. F. G. Donnan, F.R.S., of University College, London. That is, when a membrane separates two solutions of electrolytes and the solution on one side contains an ion (in this case a protein ion) which cannot diffuse through the membrane, the final result will be an unequal distribution of the diffusible ions, so giving rise to potential differences and osmotic forces, and also, in the case of gel particles, to variation of swelling, as first suggested on the basis of the Donnan equilibrium by Procter. If now we accept the further view of Loeb that the colloidal particles or micellæ of a protein colloidal solution can be treated or regarded as very small gel particles out of which protein ions cannot diffuse, but into which crystalline ions can, then it follows that the size and surface electric charge, and therefore also the stability—that is, the tendency to remain dispersed or to aggregate—of the protein colloidal particles will be determined by the unequal distribution of the ions

* At the writer's suggestion.

† Dixon Mann in 1902 contended that proteins behaved like electrolytes (Physiol. Histol., p. 48).

previously referred to. There seems little doubt that the hard-and-fast line between colloids and electrolytes has been to a certain extent removed by Loeb's observations and proofs, and that "colloidal disturbance" involves equally important electrolytic factors. If colloidal disturbances were alone sufficient to cause violent poisoning effects, we should expect these effects to be much more frequent in the course of most diseases.

The Allergic State.

The basal fact in allergy or sensitisation is an innate defect or disposition of the tissues concerned, expressed as an abnormal reactivity. This disposition is transmitted; even though appearing late in life there is no sure ground for believing that it is acquired. Thus, one groom in 1000 may ultimately become horse-sensitive, or one baker in 1000 wheat-sensitive, because an inherent dormant disposition has been activated. Once activated, this labile state of the tissues tends to increase; nor could the permanent removal of the exciting factors ever abolish it, though in young persons the sensitisation may weaken as growth proceeds. In such, the skin reactions may be seen to lessen year by year, and the general symptoms may abate or cease, at least for a time. Some weighty considerations regarding the unlikelihood of sensitisation being acquired are presented by Rolleston.[15]

In the allergies—hay fever, asthma, migraine, epilepsy, urticaria and other skin conditions—it is hardly correct to say that the patient is, or has become, sensitised by a "foreign" protein inhaled, ingested, or autogenous, as the sensitisation is already present naturally and may to some extent be compared to the zymogen in a cell which remains inactive till the appropriate excitant reaches it. In a sense, the foreign substance may be said to sensitise, but activation or excitation are the more correct expressions. This is further borne out by the fact that when a cell is naturally sensitised, it can, as a rule, be activated by many different substances, both antigenic and non-antigenic.

Some American observers consider that, as in allergy, the effect of partial neutralisation of antibody is not in evidence, and also, that as complete desensitisation with repeated doses of antigen, as in artificial anaphylaxis, does not take place, the reaction cannot be due to antibodies in the cells. But it is legitimate to consider that if the antibody is autogenous, its quick replacement might occur, and the antigen might even stimulate its production. Besides, many observers have reported passive sensitisation with the serum of allergic subjects. On the other hand, in multi-sensitisation it is difficult to believe that the cells contain separate natural antibodies for each protein. The fact that many non-protein substances (histamine, drugs, &c.) may give skin reactions which superficially are indistinguishable from those produced by proteins, further complicates the issues. In certain other conditions, such as dermatitis venenata, the irritant seems to exert its action solely on the skin, and the reaction seems to increase with successive exposures to the irritant, and as age advances. Conflicting statements have been made as to the exhaustibility of the dermal reaction as between proteins and non-proteins (Mackenzie and Baldwin,[16] Cooke[17]). Apparently the common factor, as in anaphylactic reactions generally, is a non-specific poison affecting the capillary endothelium, which varies in intensity according to the nature of the irritant, the reactivity of the skin, and the modifying conditions dependent on the presence or absence of a more or less general sensitisation.

The enormous output of American work on the skin tests within recent years has gone to show that reactions to pollens and the animal epithelia are fairly reliable indicators of a sensitiveness which is more or less general, but that as regards foods, there is no rule in the readings. Multi-sensitisation nearly always occurs, to proteins in entirely different groups. It is evident that the entire substance as used in the test may be so altered by the digestive juices as to render it innocuous; while, on the other hand, the skin test may be negative and yet constitutional symptoms are produced on ingestion. Out of 939 cases investigated by Rackemann,[18] in only 13 were food tests important or of use in treatment, and in only a very small number, chiefly in children, was benefit derived by withdrawing the particular food from the diet. Apparently in some cases, the food allergen may be absorbed by the mouth. According to the tables of Baker[19] and of Peshkin and Rost,[20] at least 10 per cent. of normal children give dermal reactions to proteins. Possibly in the majority of these the hypersensitiveness is limited to the skin.

It is commonly believed that in cases traceable to foods the ingested protein must pass unchanged through the intestinal wall. Excepting possibly the case of infants with disordered digestion, there is no proof of such a leakage, nor is it a necessary assumption since (as in the case of the sensitised animal) activation is possible with all sorts of substances. Thus, an asthmatic attack can often be induced by such substances as peptone or histamine. Is it not possible that the symptoms may be produced by a constituent or disturbance of the food which acts similarily to an urticaria-producing drug? Why should the leak admit one protein only? It has even been asserted (Shannon[21]) that the sucking child may suffer from the effects of a protein which the mother has taken in excess, and which has found its way into the breast-milk, and that guinea-pigs sensitised to the fed protein will react anaphylactically to the milk as compared with normal controls. Now, in the first place, physiology teaches that the transformation of food protein into milk protein is governed by the same laws as apply to growth, the milk protein being built up of amino-acids (McCollum[22]). In the next place it has been shown by Hartwell[23] that an excess protein diet in the nursing rat causes a poisonous state of the milk, producing spasms and often death in the young. However this poisonous quality is acquired, it might cause anaphylactoid symptoms in the sensitised animals. In any case the controls in experiments with milk ought to be animals sensitised to a different protein than that fed to the mother, as doubtless they would react to the milk injection in the same manner.‡

It is a curious circumstance that the more severe cases of asthma, at least in adults, very rarely give dermal reactions, while the great majority of asthmatic adults are also negative. Also, as in any case dermal reagents form but a fraction of the possible excitants (of the attack), we must regard the excitants as being mainly autogenous, some metabolic product, either faulty in itself, or inadequately reduced. This is occasionally in evidence as the poisonous products resulting from endocrine and ovarian disturbances which appear competent to induce epileptiform attacks, asthma, and migraine; cures having been effected by the administration of thyroid, ovarian substance, &c. (Asche,[24] Ross,[25] and others). Some curious examples of auto-excitation are recorded by Whitfield.[26] Amongst the allergies, it is particularly noticeable in asthma that great variations are encountered in respect of the reactivity to proteins, the symptoms, course, and the results of treatment. We must regard these variations as mainly due to individual peculiarities. This was even found in guinea-pig experiments with peptone by Novy and De Kruif, a dose which was fatal to some animals being without effect in others, while the coagulation-time, blood pressure, &c., showed great variations "due to inherent or developed factors in the given individual."

The Treatment: With Illustrative Cases.

In the clinical examination special attention is needed to the teeth, nasal cavities, tonsils, or other possible sources of infection; to the state of the lungs, the circulation, and digestion; to the presence of the rheumatic or gouty diathesis; and to endocrine defect. Great difficulty is sometimes encountered with nasal

‡ Since this was written Shannon's results have been directly challenged in experiments by Stuart (Amer. Jour. Child. Dis., 1923, vol. xxv., No. 2, p. 135).

affections, disease of turbinals, polypi, &c., as operations are sometimes inimical or make the asthma worse. It is better to treat cases urgently requiring such at first, and then to wait some time before beginning the immunisation. As a rule such nasal treatment does not benefit either asthma or hay fever. The skin tests may give valuable information. The patient usually knows what things to avoid; in other cases he does not, but, as by the peptone treatment the sensitiveness to them can usually be overcome, it is often unnecessary to insist on their avoidance, particularly ordinary articles of diet. During the treatment the diet should be plain, very moderate, and diuresis encouraged by drinking water or soda water.

In cases where dermal reactions to proteins are given the peptone acts more rapidly and often more effectually. It is a curious circumstance that after the constitutional symptoms have subsided, these reactions persist. This peculiarity is confined to the skin. Otherwise, the desensitising effect of peptone is universal, and includes bacterial intoxication. Dr. Warren Crowe, of Harrogate, has informed me that in certain rheumatic subjects extremely sensitive to bacterial vaccines, a preliminary course of peptone renders them tolerant. The sensitiveness produced by bacterial intoxication has recently been well elucidated by Pratt-Johnson.[27] Asthmatic subjects are often highly sensitive to vaccines, including tuberculin, and the symptoms may be greatly intensified by them. This is due to the abnormal reactivity which the sensitised individual exhibits to protein poisons in general. The experience of van Leeuwen[2] with tuberculin is a case in point, and does not necessarily imply a special sensitiveness to that particular substance. When a specific organism is definitely producing the toxic protein causing the asthma, either directly or indirectly, treatment with the organism should succeed. But such cases are few, and in general vaccines act non-specifically. Dr. Rackemann, who has had a very extensive experience with them, particularly the autogenous variety, tells me that he is compelled to regard their action as non-specific. Experiments are needed to assist in elucidating the matter. The more one sees of asthma, the less one connects it with bacteria.

The Armour peptone, which gave such good experimental results, has for a long time been recommended by the writer for general clinical use, as its proteose content is adequate and it is free from histamine and non-irritant. Most other peptones are deficient in proteoses. Witte's peptone contains histamine and its proteoses are rather toxic. Hence, though very valuable in certain circumstances and cases, it must be employed with great caution. It can be detoxified, however, by a simple process, and yields a useful product which shall shortly be alluded to. Peptones made from vegetable proteins are also valuable aids in certain cases. The peptone solution should always be given either intravenously or intramuscularly, the latter method being appropriate in children and weak elderly persons. The hypodermic method is not only less efficacious, but is open to the fatal objection that it is impossible to adjust the dosage. Only by the intravenous method can such be done, or accurate reactions (if desired) obtained. Intramuscular injections often succeed when given by rule of thumb, but if the case is not satisfactorily responding, the intravenous method should be substituted.

Some illustrations of the treatment may now be given, it being understood that the Armour peptone has been used, unless otherwise stated. A 5 per cent. solution in physiologic saline is used for intravenous use, and a 7·5 per cent. solution for intramuscular use. They must be very carefully prepared and sterilised by heating up to 60°–65° C. and then made faintly alkaline by soda or borax, the latter acting also as a preservative; otherwise 0·5 per cent. phenol is used. The injection is given slowly to avoid reactions, and it is never given during the attacks. Dosage 0·3 c.cm., increasing by 0·2 c.cm. up to 1·5 c.cm. or over.

CASE 1.—Male aged 14. Asthma since 18 months old. Has also had eczema and symptoms of hay fever from time to time. Father, paternal grandmother, and an aunt had asthma; a sister also has asthma. The attacks last a few days, then there is more or less freedom for a week or two, except at nights. Turbinals cauterised four years ago without benefit to the asthma. Is horse-sensitive, and gets violently sick on eating a soft-boiled egg, but can eat one hard-boiled. Is otherwise healthy and well grown. His dermal reactions gave horse-hair 1·5 cm.; egg 1 cm., egg-peptone negative; pollen negative. He got 11 intravenous injections of peptone, beginning with 0·3 c.cm. and increasing by 0·2 c.cm. twice a week up to 1·5 c.cm., no constitutional reactions being produced. The asthma ceased after the fifth injection, and no relapse occurred. In eight months he reported himself quite well, but the skin tests remained though less marked. Then after ten months he reported; he had remained perfectly well and found some time ago that he could eat soft eggs with impunity. The dermal reaction at this time to egg was still 0·7 cm., and irregular; horse-hair 1·3 cm. with spikes; no asthma on proximity to horses.

This case is typical of many, especially in young persons, in which peptone acts as specifically as anything in medicine (in the therapeutic sense) and that whether skin reactions be present or not. Children giving reactions to cat hair, rabbit hair, and feathers have been desensitised without removing the animals; in other cases when the animals were removed, the asthma was unaffected but yielded to the peptone. Ratner[28] in eight cases of rabbit sensitiveness found that rabbit hair extract in every dilution aggravated the symptoms, instead of desensitising. Note in the above case that when the mucosa of the stomach could tolerate soft-boiled eggs, yet the skin reaction persisted.

CASE 2.—Female aged 28. About six years ago she went to Johannesburg where the dust apparently brought on sneezing attacks. Several of her nearest relatives suffered from hay fever and asthma. Returning home she underwent several operations on the nose in 1918 at the hands of Sir StClair Thomson without much relief to the symptoms. In the autumn of 1921 the sneezing attacks were so violent and prolonged, continuing for hours, that her condition became alarming. Skin tests negative. She received 15 peptone injections intramuscularly from her own doctor and since then the attacks have entirely ceased.

Whatever the irritant which inaugurated the sneezing attacks the sensitiveness was constitutional and doubtless reacted to various inhalants. Hay fever cases often do extremely well on peptone often when given intramuscularly; nor need it always be given in advance, as the active symptoms yield.

CASE 3.—Female aged 45. Severe attacks of migraine since 14 years. Father had asthma; mother had migraine. The attacks come once a fortnight or once a month, practically always at the menstrual periods. First headache, soon followed by violent sickness for 24 hours. When the sickness ceases the pain locates itself on a small area in the left temple and goes on another 24 hours. Otherwise strong and healthy. Diet has no influence on the attacks. In this case the injections were given weekly. The first effect (after three injections) was to abolish the sickness and the pain shifted to the right temple, quite a new experience. Then a month elapsed without any attack. She had occasional headaches of a neuralgic character during the next two months, but nothing compared with her former previous life of martyrdom. She received 12 injections without the production of any reaction. Her condition remains highly satisfactory.

Migraine is common in women, especially at or near the menses, but also intermenstrual attacks occur. The treatment may stop them at least for a time or it may only stop the intermenstrual attacks. Absence of worry and an easy open-air life are invaluable aids to a cure. Certain cases of epilepsy also respond extremely well to the peptone injections.

CASE 4.—Male aged 55. Three years ago catarrh and suffocative spasms severe in character came on during the night, with profuse glairy expectoration. For a time he was confined to bed. Latterly the attacks came by day as well, rendering him practically an invalid. He had had the best medical advice and many remedies had been tried but to no success. Adrenalin was without any effect. He was recommended by Dr. F. Heasman, of Boscombe, for the peptone treatment. After the first injection he had good nights, and after the second the asthma had entirely

vanished. He received 12 injections in all as a precautionary measure, no reaction being produced by any of them. Some time afterwards he had some nocturnal wheezing but not such as to necessitate further treatment.

Although the treatment acts very promptly in many cases, it is not often that it does so in such a dramatic fashion as in this case; so as a set-off to it, take the following:—

CASE 5.—Female aged 36. Anæmic, emaciated, and fragile. Maternal grandfather and mother were asthmatic. She gave the following in her personal history: Typhoid at 14; peritonitis at 19; pelvic cellulitis at 32; influenza in 1919. Asthma began in August, 1920, along with symptoms of hay fever; getting worse. At present the attacks are most violent and frequent, daily and nightly. The chest was not emphysematous, but rhonchi were present. No hay fever symptoms. Skin slightly positive to pollen. The sputum contained many mucous casts of the bronchioles, including spirals, myriads of eosinophiles, and granules, and a long-chain streptococcus. The treatment was carried out intravenously by her doctor in the usual graded doses at first. She was sensitive and gave some marked reactions to the peptone. After two months there was practically no improvement. She was then tried with a compound peptone—that is, one composed of animal and vegetable peptones, and an improvement definitely set in, some weight being gained also. This improvement only lasted six weeks, and the attacks returned as bad as ever. She then had some streptococcus vaccine, but without any benefit.

Here was asthma of a very "malignant" type, and the feeble condition of the patient gave it full rein. The sensitiveness to peptone is hardly surprising, and for such cases a useful preparation to begin with is detoxified Witte's peptone. This is made by agitating the peptone with excess of 97 per cent. alcohol for a minute or two which extracts the histamine and the more toxic moiety of the proteose. After filtration the non-toxic proteose residue is dried and dissolved. This solution can be given intravenously in large quantity without producing reaction, and possesses undoubted desensitising properties. Note in this case that with a marked family predisposition the asthma did not develop until the age of 35. Also the absence of emphysema is noteworthy. The most violent attacks of asthma occur in non-emphysematous subjects, and is related to the fact that in emphysema the air tubes are distended and have largely lost their elasticity, and so the dead space is more capacious and free.

A case resistant to peptone is not always a severe one. In two patients (unrelated) who resided near each other in the same town asthmatic attacks of a moderate character were very troublesome at night. Both patients were quite free of asthma in London, and usually also if away from home. Nevertheless the most careful treatment by peptone failed to remove the nocturnal attacks when they returned home. Some undiscoverable local conditions were at work evidently producing an atypical disorder.

CASE 6.—Female aged 40. "Chesty" since 11. Asthma since 25 off and on. Father, a sister, and a brother asthmatics. Has been getting steadily worse since 1917, and for the past two years is laid up for three to five weeks three or four times annually with "terrific" attacks. Adrenalin makes the symptoms worse and narcotics have to be employed to an extent rather alarming to her medical advisers. These and the strain of the attacks had reduced her to pretty much of a wreck. Some time previously she had been tested for proteins, &c., and received from a physician a vaccine which immediately on use brought on the asthma very severely and so had to be abandoned. She was wasted and haggard-looking. After the first few injections, they were continued by her doctor, and after nine or ten (1·3 c.cm.) there was a slight yet definite all-round improvement noticeable by her friends and relations. The treatment was persevered in, but latterly began to upset her, even in moderate doses, causing headache, severe pains in the limbs, and some rise of temperature. The dose had to be gradually reduced to about 0·5 c.cm. and the compound peptone was substituted for the ordinary. Her sensitiveness to the peptone increased so that she reacted to 0·3–0·4 c.cm. even when diluted with saline, and her doctor who carried out the treatment with the greatest care had considerable difficulty in adjusting the dosage. Nevertheless, a great improvement was steadily going on; and the asthma had practically ceased, while the general health was being restored. The treatment was continued by five- to eight-day inoculations for several months. Eighteen months have elapsed, and the patient remains well and is delighted to be able to take country rides on horseback.

When peptone is administered over a very long period, it is usually better tolerated, at least for a time, but a few cases get hypersensitive, which, however, is not a drawback. Note in this case may also be made of the severe pains following the injections. These are often encountered in rheumatic or gouty subjects owing to the increased katabolism which peptone produces. In one case, in addition to severe body pains, a number of subcutaneous nodules appeared over the scalp.

CASES 7 and 8.—These may be taken in conjunction, as they illustrate certain features in common, particularly the successful result of prolonged treatment, and the tolerance of large doses. Male, aged 44, had suffered from asthma for eight years. Mother was asthmatic. Attacks occurred almost nightly and it was brought on by any exertion during the day. He was also subject to attacks of bronchitis attended with much expectoration, but he did not connect these specially with the asthma. His doctor had given him autogenous vaccine prophylactically, apparently with benefit. Health otherwise very good. He was free of bronchitis but suffering from asthma when the peptone treatment was begun. After nine injections the asthma had practically gone, when unfortunately he had a severe bronchitic attack which laid him up for several weeks. The asthma also gradually developed and had become as bad as ever when the bronchitic attack was over. The peptone treatment was resumed, and given every four days and then weekly for three months, the dosage rising to 3 c.cm. without producing any reaction, apart from the slight leucocytosis which always follows. During this time, the asthma had entirely gone, and for the past seven months he has been quite free from symptoms.

The other case, female, aged 55, had also suffered for eight years. Very severe attacks every three or four weeks lasting two to three days; adrenalin gives relief for a few hours, then the attack recommences. Family history negative. Never quite free between the attacks. Treatment by peptone was begun, but during the fourth week an attack supervened as usual. When quite better the treatment was recommenced with small doses, and the dosage gradually worked up to 3–4 c.cm. so as to produce a mild reaction, giving a rise of temperature after a few hours of about 1·4° F. These latter doses were given weekly, and the peptone was combined with either a small quantity of Witte's peptone or else a peptone made from wheat of rather an active character. During the four months she was under treatment, there was only one slight attack of asthma. Six months afterwards she wrote stating that she remained perfectly well.

In these two cases the prolonged treatment ultimately subdued the asthma, and large doses were tolerated. Sometimes in men one finds temporary sexual disability under these conditions. The reactions were produced in Case 8, as elderly and stubborn cases often need a fillip. In general, also, if after a number of non-reactive doses, improvement is unsatisfactory, mild reactions must be induced when a rapid improvement may ensue. When, as in this case, an attack occurs during the treatment, one must wait until recovery is complete, and then begin again with a very small dose, as the result of the attack is to produce the protective substance, anti-anaphylatoxin. Anti-anaphylatoxin is also produced by a single big dose of peptone, but the protection is fleeting. On the other hand, the gradual immunisation by small doses creates in addition that disorientation of the sensitised tissues towards the exciting agents which renders their attacks abortive for a longer or shorter time, according to the nature of the case.

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A CASE OF
EROSION OF THE RECTUM BY AN ECTOPIC PLACENTA.

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EROSION of a hollow viscus by an ectopic placenta is fortunately an extremely rare occurrence, for the consequences may be very serious. The case here recorded was remarkable in that severe hæmorrhage from the rectum was one of the initial symptoms of ectopic pregnancy.

History.—The patient, a married woman, aged 34, bipara, was admitted to the French Hospital under Dr. Septimus Sunderland on account of intermittent griping pain in the lower abdomen, constipation, and severe pain in the rectum during defæcation. The past medical history was negative, except that after the birth of her second child, eight years before, the patient had been very ill from pelvic peritonitis and was kept in bed for five months. When convalescent she was curetted at Liège and became pregnant some few months after, but the pregnancy ended in abortion. There had been two miscarriages before the birth of the second child.

The present illness commenced three weeks before admission with a sudden attack of colicky pain in the hypogastrium. The pain was so acute that the patient had to rest in bed for a few days and, on getting up, it returned with increasing severity. Obstinate constipation supervened, and with it intense pain in the rectum, causing a false desire to go to stool. Without the help of enemata the bowels refused to act, and when they did the agony was excruciating. At no time during the present illness had any blood or pus been passed per rectum. On being questioned, the patient stated that on the sixteenth and fifteenth days before admission there had been some blood-stained vaginal discharge, but this she regarded as her normal monthly loss, although it was much less than usual. Previous to this the periods had been regular and normal.

Condition on Examination.—The abdomen was flat and soft and moved freely on respiration. A hard swelling about the size of an orange could be felt projecting above the pubes. It was slightly mobile and not tender. Per vaginam, the cervix was found to be high and tightly pressed against the symphysis. The posterior fornix was bulging from the presence of a hard rounded swelling which, per rectum, appeared to be about the size of an egg. No fluctuating point could be detected.

Three days after admission the patient had a severe hæmorrhage from the bowel and became very pale and collapsed. Dr. Sunderland asked me to see her as he had found in the bulging wall of the rectum, just within reach of the finger, an umbilicated depression about the size of a sixpence. Further examination showed that the depression had a sharp, clean-cut edge, and that it extended through all the coats of the rectal wall. The base appeared to be formed by the tumour in the pouch of Douglas. We discussed the possible causes of the condition and decided that most probably the case was one of ruptured tubal gestation with erosion of the rectum by the placental trophoblast. I arranged to make a direct examination of the rectum with the sigmoidoscope, but before this could be done the patient had another attack of hæmorrhage and looked as if she were going to die from loss of blood. Immediate operation was decided on.

Operation.—When the abdomen was opened no free blood was found. The suprapubic swelling proved to be the fundus uteri, occupied by a fibroid the size of the closed fist. Signs of old inflammatory trouble were evident in the left tube, which was converted into a small retort-shaped hydrosalpinx, and in the left ovary, which was firmly embedded in the mesosigmoid. The right tube turned sharply down behind the uterus and entered Douglas's pouch, the mouth of which was closed by adhesions. These were separated and the tube traced downwards; it was found to terminate in a ruptured tubal gestation. In order to get better exposure the uterus, with the left tube and ovary, was quickly removed by subtotal hysterectomy. The right tube with the adherent mole were then easily shelled out, care being taken not to enlarge the opening in the rectum. No blood or pus was found in Douglas's pouch. An attempt was made to suture the opening in the rectum, but as that proved impossible the posterior fornix was incised from above and a large drainage-tube passed into the vagina. The mouth of Douglas's pouch was then closed by a purse-string suture, and reinforced by stitching the anterior peritoneal flap made in removing the uterus to the rectal wall above. By now the condition of the patient was far from good, so it was decided not to spend even a few minutes more in performing a temporary colotomy. The patient was put back to bed and kept under morphia; in two days she had improved sufficiently to permit of the colostomy being done.

Examination of Parts Removed.—The ectopic gestation had evidently occurred in the ampullary end of the tube, and the gestation sac had been extruded by tubal abortion rather than by tubal rupture, for the ostium, although expanded, was intact, except for a small tear in its upper edge. Part of the mole remained within the cornucopia-like end of the tube. Dissection of the mole revealed a small amniotic cavity containing the crushed remains of a tiny fœtus a few millimetres long.

After History.—The patient passed through a stormy time during the first week, for although there was free drainage from the vagina, signs of pelvic peritonitis developed. The pulse became quick and feeble, and the whole aspect of the patient denoted toxæmia. Fortunately there was no intestinal paresis, and the colostomy acted well from the start. About the seventh day the patient began to improve and was able to get up on the twenty-first day. The colostomy was closed on the fifty-ninth day, the aperture in the rectum having healed soundly. When viewed with the sigmoidoscope a small white scar was all that remained to show where the erosion had taken place. The patient left the hospital in excellent health a fortnight later.

Remarks.

Search in the literature shows that very few similar cases have been recorded, and I have been unable to find an exact duplicate. In a paper read before the Section of Obstetrics and Gynæcology of the New York Academy of Medicine,[1] H. C. Chase described the case of a patient of 25, in whom three months' amenorrhœa was followed during six weeks by painless hæmorrhage, and subsequently by vomiting and hypogastric pain which continued for 17 days. At this juncture the pain diminished, but a large amount of dark clotted and bright red blood was passed per rectum. At the time of her admission to hospital, in a state of grave anæmia and collapse, examination was negative except for a mass the size of the fist in the right side of the pelvis. At operation the cæcum was adherent to the posterior surface of a ruptured right tubal gestation, and, when it was separated, a hole in the bowel wall, a little larger than half-a-crown, was seen. The cæcum contained clot and the entire fœtus. There was no free blood in the abdominal cavity. The rent in the cæcum was repaired, the ectopic mass removed, and a drain placed in the posterior fornix. The patient made a good recovery. At the same meeting, Vineberg related a case where an ectopic pregnancy formed in the small stump of the tube left after salpingectomy for pyosalpinx some time before. The ovular sac was bounded in part by a portion of the sigmoid. Hæmorrhage from the bowel had occurred, but at operation he could not find any opening in the intestine. Evidently the villi had eroded the wall of the sigmoid sufficiently to produce bleeding but not enough to cause a defect perceptible to the naked eye.

[1] Chase, H. C.: Medical Record, N.Y., Dec. 4th, 1920, p. 957. Vineberg: Ibid.

TREATMENT OF THE FLAIL ELBOW-JOINT

WITH A NEW OPERATION OF ARTHRODESIS.

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THE complete flail elbow is not a very rare condition; in my own experience, during the year before this article was written, I have seen six complete and upwards of a score of partial flail joints. The complete flail joint is one in which the patient has absolutely no control over movement and in which there is mobility in all directions. In many cases, particularly following operative treatment, the forearm may sometimes be rotated a complete turn of 360° on the upper arm, there being no bony or cartilaginous connexion between the two. In the partial flail cases there is some apposition between the bone ends, and the muscles are sufficiently preserved to exert some leverage.

Causes.

The great majority of such cases at the present time result from gunshot wounds, which have been treated, usually in the Front areas, by excision of the wounds and bony fragments. In most cases sepsis following wounds has further militated against the preservation of function; in a few cases it has occurred after too generous excision of a tuberculous joint, whilst in rare instances a flail elbow is seen resulting from paralysis of the muscles acting on the joint. In these cases, however, the joint surfaces are preserved, and the treatment is to some extent simpler.

Many of the cases, particularly those following operative treatment, are further complicated by nerve injury, most commonly of the ulnar nerve, but in one case referred to below the radial nerve was completely severed, greatly increasing the disability. One case had been treated by an extension applied to the arm through the fingers, which had so stiffened up that grip was much impaired.

Influence of Occupation on Treatment.

In consideration of treatment of a flail elbow the patient's occupation is of the utmost importance; he may require a strong stable joint, or a moveable joint which, although weak, may be brought under some control by operation or the use of apparatus. The arm has also to be considered; in a right-handed person a strong left elbow-joint is probably of less importance than a movable one. Not only the patient's occupation, but also his other pursuits must be ascertained; in a recent case I had decided on occupational grounds to perform an arthrodesis, when the patient remarked that his principal amusement was violin playing; this was a left elbow-joint, but his playing made it important to retain movement of the fingers up and down the strings in a "creeping" method which would, of course, have been impossible with an arthrodesis.

Treatment.

Before any definite decision is made concerning the patient's future I consider it important that he should have a course of at least six weeks of physio-therapeutic treatment, the arm being carried in a sling in order to shorten the flexors of the elbow-joint. Even better than the sling would be a light plaster case bivalved and removed daily for treatment, which would consist of massage, active and passive movements, but particularly active exercises, principally in the direction of flexion, and faradism to the muscles acting on the elbow-joint. Such a course of treatment can make a vast difference to apparently hopelessly flail cases. After the utmost has been got out of the joint by these means the possibility of controlling the joint by some appliance, or the necessity of operation, must be considered. If the man has any power of flexion in the joint there seems no doubt that some sort of appliance is preferable; of the appliances on the market I particularly recommend two—the Mackay flail-elbow appliance and Young's flail-elbow appliance. If there is no power of flexion, even although the joint is supported, the Mackay appliance is the better, because by an "elbow flexion cord" taken to harness on the opposite shoulder the man can get a certain amount of flexion by forward movements of this shoulder. He can also lock the joint in any position. If the patient has any power of flexion Young's appliance is very satisfactory; with this the man can bring the arm up to a flexed position and retain it by a simple automatic catch, on release of which catch the elbow-joint is again freed. The joint can also be permanently locked at any desired position. The drawback to both these appliances is that there is no control over the forearm movements; the forearm is usually completely supinated and cannot be altered. Further, there is great difficulty in preventing the appliance slipping down the arm in such a manner that the flail joint and the appliance joint do not act on the same plane. If stability is required, however, and particularly if the appliance is found to be cumbersome and uncomfortable, some operative treatment is indicated.

Choice of Operation.

We have a choice between five operations, some of which are mentioned only to be condemned:—

1. Silk ligaments have been used, being threaded through the humerus and through the ulna to keep the joint in a position of flexion.

2. In the same way fascial transplants from the fascia lata of the thigh have been used. I have no experience of these operations, but they seem of doubtful utility, the joints still being flail to a considerable extent afterwards.

3. Sir Robert Jones recommended a plastic operation on the skin; he removes a diamond-shaped area from the front of the joint and stitches it up transversely to keep the joint flexed. This, I feel sure, is now given up, as the stretching of the skin gives a bad end-result.

4. Goetze's method is simple and to some extent efficient, but it necessitates the use of a complete supporting apparatus. This operation consists of freeing of the lower arm extensors and flexors and their transplantation. After a short time the free working muscles become so strengthened that function of the joint is obtained by use of the Goetze apparatus. A certain amount of pronation and supination is also stated to be possible with this apparatus.

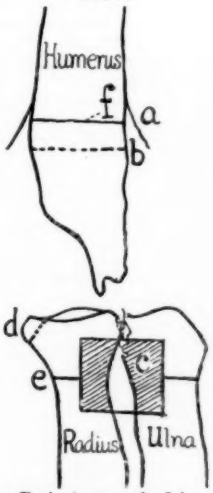
5. Probably by far the most preferable operation is arthrodesis. Previous to the operation I am about to describe I have not seen a successful result from arthrodesis; the elbow is admittedly not an easy joint to deal with, but I am sure that most of the bad results are due to badly-planned operations. Too much has hitherto been expected of the joint in the devitalised state of its bony fragments and the poor immobility given by previous operations. The adjoining surfaces of the radius and ulna have been bared in wedge-shaped fashion and the humerus similarly bared and wedged between the ends of the forearm bones. Even with wiring no stability resulted from this union; ankylosis must have been very rare and had never occurred in any case I saw. Having little faith in this operation, I never performed it; it seemed to me, however, that if the flail elbow resulting from excision—particularly where the lower end of the humerus had been removed—was treated rationally the patient could almost be promised a complete arthrodesis. The operation which I devised and now perform in this type of case is as follows.

Technique.

Access to the joint is obtained by a median posterior incision; particular care is taken of the nerves, especially the ulnar nerve on the inner side: two skin flaps are reflected well forwards and the triceps is

stripped upwards. The forearm muscles are then freed from the bone, but the periosteum is left attached. The lower sclerosed end of the humerus (usually about ¾ inch of bone) is then completely removed; the periosteum above this is raised in a cuff leaving the bone bare. The bone is next filed into a complete square with an ordinary rough file. The position of ankylosis is next decided. It is not, of course, possible to give the desired position absolutely, but with a certain amount of trouble some pronation or supination can be obtained. The forearm bones are then dealt with. It is usually found that the two bones are ankylosed at their upper ends, either by bone formation or by strong fibrous tissue. This is preserved as far as possible, particularly while the bones are being sawn. A square hole (see Fig. 1) is now sawn as near as possible to the ends of the bones, the square fitting the already similarly-shaped humerus. A small fine frame saw, with detachable blade, is the most useful for this purpose. The humerus is then fitted into the square and a bone drill used to perforate a hole from side to side of the two forearm bones through the end of the humerus. Stout silver wire is passed through this hole and tied, with the knot in front of the joint. This position of the wire precludes pressure on the skin and consequent irritation. Behind there is not a great amount of muscle to cover the wire, but in front of the joint it is deeply buried. The ends of the forearm bones are bevelled as much as possible to prevent any projection. When the wire is in position it is found that a very good firm apposition is got. The cuff of periosteum, usually split in two or three places longitudinally, is brought down and stitched over the line of union, so helping bone formation in the part of greatest need. It is now important to get a good muscle covering for the ends of the bone. This is usually obtained without much difficulty, the triceps being particularly useful. The skin is sewn with silkworm gut without drainage, and a plaster cast applied over all, to include shoulder, wrist, and chest. This is retained for three months at the end of which time it is taken down, the stitches are removed, and a small cast, including arm and forearm, put on for six weeks. A sling is applied after the small plaster has been removed and daily physiotherapeutic treatment started, massage and faradism being used to get the muscles into condition, and ionic medication with calcium to strengthen the callus.

FIG. 1.



a, Periosteum raised in a cuff. *b*, Sclerosed end of humerus removed and end squared. *c*, Square cut out of ulna and radius. *d*, Part of the bevelling. *e* and *f*, Hole for silver wire.

FIG. 2.

CASE 1.—Much new bone formation round ulna and radius. Lower end of femur gone. Apposition when bones approximated, but no control.

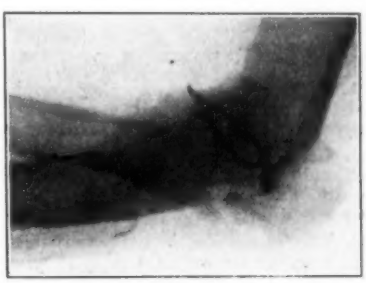
FIG. 3.

CASE 1.—Showing the result 14 months after complete bony ankylosis, with good new formation of bone by the separated periosteum.

FIG. 4.

CASE 2.—Lower end of humerus gone and remainder sclerosed. Greater part of olecranon removed. Some ankylosis between radius and ulna.

FIG. 5.



CASE 2.—X ray taken ten months after operation showing the complete ankylosis with much new bone formation. Wire is brought round in front of the joint and knotted at the side.

CASE 1 (Figs. 2 and 3).—A man, aged 25, wounded through the right elbow-joint in March, 1918. Wounds excised at the base in France, and he was discharged from

hospital in April, 1919, following prolonged sepsis. At the end of 1919 an attempt at arthrodesis performed. Admitted to my care in April, 1920, because of the "uselessness of his arm." On examination the elbow-joint was practically completely flail; only a few degrees of voluntary flexion possible from the extended position. No power of extension. Forearm could be rotated through a half-circle on the arm. Extensive scarring round the elbow-joint. Patient had worn a supporting apparatus, but found it impossible to carry on his work as a labourer. There was a further complication, a complete musculo-spiral nerve lesion below the origin of the triceps branches. X ray showed that the whole of the lower end of the humerus and the greater part of the olecranon had gone. There was much new bone around the ends of the ulna and radius. The bone ends were fairly healthy in appearance. In a right-handed labourer a strong right elbow-joint with the angle greater than a right angle, about 110°, and the forearm in the supinated position is preferable. The tendon transplantation for the nerve injury was deferred until the bones were stabilised to give better leverage. It was decided, therefore, to perform arthrodesis.

Operation.—The operation on May 5th, 1920, was exactly as described above, except that the wire was knotted behind the joint. A good covering of muscle was obtained. Before the plaster cast was applied the joint was beautifully firm, and this position was retained without difficulty while applying the plaster.

On July 25th the plaster and stitches were removed; wound completely healed, joint feels firmly ankylosed. Light plaster case applied, and removed in its turn on Sept. 8th. The joint was firm; light massage and faradism, calcium ionisation, X rayed. In August, 1921, joint was firmly ankylosed. The patient uses it freely and the muscles are in good order.

CASE 2 (Figs. 4 and 5).—A man, aged 27, wounded in right arm August, 1918. Wounds excised in France; healed up in December, 1918. No further operation. Admitted June, 1920, because of "weakness of arm." On examination the right elbow-joint was flail, with no power of flexion or extension. Ulnar nerve involved in scar, but not completely severed. Only slight scarring of skin, sepsis having apparently been a minor consideration. X ray showed that the whole of the lower end of the humerus had disappeared; the end remaining was somewhat conical, being in apposition to the forearm bones. The olecranon process had also been excised in great part and there was some new bone formation round the ends of the ulna and radius, apparently firmly ankylosing them. The patient was a labourer and found the arm useless to him. He was keenly desirous of having the joint ankylosed.

Operation.—The operation, on July 6th, 1920, was as described. The ankylosing of the forearm bones made immobilisation an easy matter. After fitting and drilling, the terminal portions of the ulna and radius were cut as nearly flush as possible and the insertion of the triceps fixed over them. The ulnar nerve was carefully preserved, no attempt being made to free it from the scar tissue. Convalescence was uninterrupted and in October the large plaster was cut, stitches removed, and a lighter plaster applied after X raying. The patient was discharged from hospital with the joint firmly ankylosed; he is now working and states his arm is "champion." In the spring of 1922 he fell on his ankylosed joint and fractured the lower end of the humerus above the arthrodesis, but it united satisfactorily and is now as firm as ever.

Conclusions.

1. Flail elbow supporting appliances are not satisfactory as a rule; the patient finds them very cumbersome and usually discards them.

2. In most cases an arthrodesis, and in all cases a stable elbow-joint, can be promised, for if bony union does not take place, fibrous union and accurate fitting give an equally good result.

3. The operation is extremely simple; the result is strong, as shown in the case where the humerus was afterwards fractured above the point of old union.

4. The elbow can be fixed at practically any angle, and there is a fair range of choice in fixing the forearm.

ASSOCIATION OF ECONOMIC BIOLOGISTS.—A meeting will be held at 2.30 P.M. on April 27th, in the Botanical Lecture Theatre of the Imperial College of Science, Prince Consort-road, South Kensington, London, S.W., when Dr. C. M. Wenyon will read a paper on Some Recent Observations on Pathogenic Protozoa of Plants and Animals, and a discussion will follow.

CASE OF HYPERTROPHIC PERIPHERAL NEURITIS,

WITH RECOVERY.

BY F. G. HOBSON, D.S.O., M.D. OXF., M.R.C.P. LOND.,

HONORARY ASSISTANT PHYSICIAN, RADCLIFFE INFIRMARY AND COUNTY HOSPITAL, OXFORD.

IN 1921 Dr. F. J. Nattrass published[1] an account of a case of recurrent hypertrophic neuritis occurring in a boy aged 18. The following case presents striking similarity in many aspects. The patient, a tailor, aged 42, gave an account of his past history and of his illness as follows, and presented a clinical picture as detailed below, when first seen as an out-patient in May, 1922. He was a distinctly intelligent and observant patient.

Family History.—Nothing of any significance could be ascertained in the case of parents or relations.

Past History.—Prior to 1910 he had suffered from a gastric ulcer for which in that year he underwent an operation, and since the operation he has been practically free from abdominal symptoms. Denies venereal disease. Has only taken alcohol on very rare occasions—practically a teetotaller; smokes very little tobacco; is married, and wife and five children are all in good health.

Present Illness.—On Jan. 20th, 1922, he had an attack of "influenza"—i.e., catarrh of respiratory passages and a temperature—when he took to his bed. His wife and several of his children also presented similar symptoms, and he had to leave his bed before he felt well enough to do so in order to care for them. His wife and children made an uneventful recovery. On his second day in bed he noticed stiffness and pain on the ulnar border of his left hand. The influenzal symptoms cleared up after a week, but the discomfort in the hand persisted, and similar feelings of pain and stiffness commenced in the right hand and in both feet. These symptoms became gradually worse, and were accompanied by increasing weakness of all four limbs and wasting of the muscles. On his private doctor's advice he underwent a course of electrical treatment, which had lasted nine weeks before he presented himself in the out-patient department, and from which he had derived no benefit. His condition had steadily deteriorated, and for the past four weeks he had experienced increasing difficulty in articulating his words and in masticating and swallowing his food. He stated that his hands "felt as large as boxing gloves," and that when reading the paper his vision was unimpaired for a time but gradually became blurred and misty.

Clinical Condition.—He walked with a shuffling weak gait with a distinct element of foot-drop. He had to be undressed, as he was incapable of performing any of the necessary procedures of unbuttoning and removing his garments. He was pale, thin, and generally wasted; none of the thoracic or abdominal viscera presented any evidences of disease.

1. Special senses: (*a*) Vision—could read ordinary print without difficulty; fields, roughly tested, normal; fundi normal. (*b*) Hearing unimpaired.

2. Cranial nerves: 1st, not tested; 2nd, as above, pupils equal and react to light and accommodation; 3rd, 4th, and 6th, movements complete, but a rapid nystagmus on looking to the left; 5th, motor weak, sensory unimpaired; 7th, weak; 8th, normal; 9th and 10th, mastication, articulation, and swallowing weak; 12th, tongue protruded straight; no wasting or tremors noted.

3. Sensation: There were disturbances of sensation of the "glove and stocking" distribution as follows. Hands: Complete loss of appreciation of heat and cold, with some blunting of pain sense, over dorsal and palmar aspects of both hands and extending up the forearm for about two inches. Complete loss of sense of position of the fingers and tactile localisation. Calves and feet: Complete loss of appreciation of heat, pain, and cold over sole and dorsum of both feet; failure to appreciate heat and cold also extended upwards to the level of the knee on each side. Complete loss of vibration sense and of sense of position of foot and toes.

Coördination of movements was not specifically examined, since the patient was apraxic as regards both hands and feet by virtue of the muscular wasting and loss of motor control. Over the rest of the body no loss of superficial or deep sensibility could be detected.

4. Motor system: (*a*) Extreme loss of power in all movements of arms, not quite so marked in lower limbs, and less

[1] Journal of Neurology and Psychopathology, 1921, ii., No. 6, pp. 159–165.

marked above than below the knees; (*b*) general wasting of all limb muscles, particularly well marked in calves, forearms, and small muscles of the hands—muscles very flaccid; (*c*) complete loss of all deep and superficial reflexes; (*d*) fibrillary twitchings well marked and observed on many occasions in biceps, triceps, latissimus dorsi, and gastrocnemii; (*e*) sphincters not disturbed.

5. The nerve trunks comprising the brachial plexus and the ulnar nerves of each arm appeared to be definitely hypertrophied and somewhat tender when rolled under the fingers. This important point was verified by making numerous comparisons with the nerves of other patients in the ward who were thin and wasted from other causes.

6. Wassermann reaction in blood, negative.

Treatment.

The patient was admitted to the wards and remained an in-patient for ten weeks. During the whole of this period he was given small injections of anti-influenzal vaccine every five days. The mouth was cleansed and all the teeth removed, the bowels regulated, and small quantities of arsenic and nux vomica administered t.d.s. After three weeks' rest in bed, gentle massage of the affected limbs was commenced, and the patient discharged to continue as an out-patient for massage. He was afebrile throughout. From the time that massage was commenced a marked improvement set in, and after attending as an out-patient for six weeks, the patient discharged himself and returned to light work at home. Normal powers of articulation, mastication, and swallowing returned some weeks before the recovery of the power of the limbs.

Re-examination in December, 1922.—The only remaining evidences of the previous disturbance are:—*Objective:* (1) Slight nystagmus, which may have been always present; (2) very slight incoördination of movements of hands; (3) the hypertrophy *without tenderness* of the palpable nerves and nerve trunks, which is still very marked in spite of the recovery of the limb muscles to the normal proportions. *Subjective:* Only complains of a little stiffness in the movements of the toes of both feet. Examination showed abdominal reflexes and tendon reflexes of lower limbs are present, normal, and equal. Plantar reflex not obtained. Biceps jerks normal and equal, triceps and supinator jerks not obtained. No disturbance of cutaneous sensation could be detected. The power of all limbs is good.

The patient has for the past month been doing 10½ hours a day heavy manual labour as a trimmer's machinist, and pronounces himself as being in every way as well and strong as before his illness. In appearance the patient is of good colour, slightly built, and thin.

Remarks.

The clinical features of especial interest in this case are:—

1. The absence of any definite toxæmia which could account for the widespread and damaging peripheral neuritis. There would seem to be no doubt that the patient experienced no more than an ordinary mild attack of influenza, since his recovery from the catarrhal and general symptoms was complete in one week. At the present date he is inclined to think that he had begun to experience some slight loss of motor power prior to his attack of influenza, but this was insufficient to cause him any apprehension or interfere with his ordinary duties.

2. The widespread fibrillary twitchings noticed over a period of several weeks which suggested some involvement of the anterior horn cells, but must presumably be attributed to damaged motor-nerve fibres in the peripheral nerve in view of the well-established sensory changes.

3. The completeness of the recovery of both motor power and deep and superficial sensibility.

4. The marked hypertrophy of the peripheral nerves and nerve trunks. This last and most important feature was noted by several observers and repeatedly verified by comparison with other individuals.

There would seem to be every reason to regard this case as a parallel to the case reported by Dr. Nattrass, who also saw this case prior to his admission to the Radcliffe Infirmary. It is impossible to prognosticate whether there will be a recurrence, but the patient's present strenuous and industrious occupation should be a good criterion of the completeness of his recovery.

I am indebted to Dr. A. G. Gibson, physician to the Radcliffe Infirmary, for permission to publish this case.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

DISCUSSION ON SYPHILIS AND MARRIAGE.

A MEETING of this Society was held at 11, Chandos-street, London, W. 1, on March 23rd, Dr. WILFRID FOX presiding, when a discussion on syphilis and marriage took place.

Dr. AMAND ROUTH opened the debate with an address, which was published in THE LANCET of March 31st.

Dr. **Fox** said that an interesting point was whether a woman who had had a syphilitic child was herself necessarily syphilitic. The modern view was that she must have syphilis, but he had not been convinced. He quoted a case described by the elder Fournier, in which a woman who had borne a number of congenitally syphilitic children was later impregnated by a healthy man and thereafter gave birth to a healthy child; she subsequently resumed her cohabitation with the syphilitic father and produced congenitally syphilitic children again.

Education as a Means of Attacking the Problem of Syphilis.

Sir JAMES PURVES-STEWART said that on the question of syphilis and marriage there were several different parties to be considered, sometimes with conflicting interests. He believed that the number of individuals who deliberately married, knowing themselves to be in an infective state, was relatively small. What answer should be given by the medical man to the syphilitic individual who wished to marry? Nowadays most syphilologists would agree that if a patient preserved a consistently negative W.R. in the blood for two years, if a provocative W.R. proved negative, and the cerebro-spinal fluid was also negative—permission to marry might be given, provided there were no physical evidences of syphilitic disease. Unfortunately the patient often indulged in promiscuous intercourse during this probation time. The State might conceivably prevent him from marrying, but the real problem was the prevention of such promiscuous intercourse, which constituted a real danger to the State.

The best mode of attacking the syphilitic problem in reference to marriage was by means of education. Firstly, insistence must be made on the intensive education of the medical profession in order to acquire increased skill in the diagnosis and treatment of venereal diseases. Secondly, the lay public, especially young people, must be educated with regard to the dangers of these diseases. One could not expect too much from attempts at educating older persons, but, fortunately, they were less likely to acquire these diseases. The first aim must be to bring about prevention. The ideal thing, from the point of view of the community, would be preventive inoculation against venereal diseases, as against small-pox, enteric fever, tetanus, &c., if it could be attained. It might be a matter of two or three different inoculations. But that idea was not yet practicable. There was not yet available a serum which was dependable as a preventive of syphilis. Failing inoculation, one must fall back upon local preventive measures. Notwithstanding certain disadvantages, which were always being emphasised by the lay press, and still more by the religious press, this prevention by local measures was vastly simpler than the life-long treatment which became necessary after infection had actually occurred. Once a man became syphilitic he required treatment, or at all events observation for the rest of his life. The medical profession had no right to withhold the knowledge of preventive measures from patients. He did not think such knowledge would necessarily produce a wild outburst of sexual promiscuity; but even if it did, this, though

bad enough, would be a lesser evil than the infection of innocent women and future children. Another problem was that of prostitution. Attempts to regulate prostitution or to stamp it out were insufficient, for the majority of cases were infectious from amateurs. The need was, therefore, to see that young men were clearly instructed as to the dangers of venereal disease. Venereal infection, in itself, was no crime; it was only a crime when the sexual connexion at which it was acquired was a misdemeanour. A man might acquire syphilis innocently —e.g., from his wife. In regard to venereal disease, innocence and ignorance were entirely different things. The most expert roué was the one best equipped with adequate means for avoiding disease, while it was the inexperienced youth, probably intoxicated, who usually acquired venereal infection. It was the duty of the profession to prevent venereal disease by every means in their power. By all means let them vigorously preach the desirability of continence in both sexes in unmarried persons; but, so long as human nature remained as at present, it would be a cruel and immoral policy to withhold knowledge concerning preventive measures from any intelligent adolescent or adult.

The Aspects of Infectivity and Life Assurance.

Dr. J. H. SEQUEIRA said that the problem of when it was the duty of the doctor to allow a man who had become infected with syphilis to marry was a most important problem, and one which bristled with difficulties. Certain tests had been laid down but it was a very difficult thing, in a large proportion of cases, to attain to such a test. There was the primary chancre type of case with a negative W.R., which could be rendered non-infective, or indeed cured, by adequate treatment in most cases, such a patient possibly never having had a positive W.R. If such a patient were watched for two years afterwards, and the W.R. remained negative, he could safely be allowed to marry. There was also the type of primary chancre with a positive W.R., and so on, to the stage of generalisation, where it was increasingly difficult to produce a permanently negative W.R. Still, in the larger proportion of such cases a cure could be procured, and the earlier the cases the larger the proportion. To these, it would be agreed, permission could be given to marry. But there was a more difficult type of case, in which the W.R. could never be rendered permanently negative. Members would recollect cases which had been treated more or less intensively for several years, without a permanent negative W.R. being secured. Some such could be possibly rendered non-infective by the administration of thyroid, but not all. As Sir James Purves-Stewart had said, the patient had to be considered from several aspects. There were two aspects from which Dr. Sequeira usually approached a case; one was from the standpoint of infectivity, the other from what might be called the life-assurance point of view, and he quoted the following case to illustrate his point: A young officer became infected during the war and placed himself in the hands of a chemist, who temporarily relieved his symptoms. The patient had no very marked secondary symptoms, but at the end of 18 months he developed complete hemiplegia. The W.R., for both blood and cerebro-spinal fluid, was positive, and he had the abnormal cell count characteristic of cerebro-spinal syphilis. It was believed that the case was of vascular origin, and that intensive treatment would get him well. Under that treatment he had now had, for a considerable time, a permanently negative W.R., his cerebro-spinal fluid was normal, and he was well. He was engaged to be married, and consultations were held between venereal disease experts and the general practitioner as to whether it would be right for him to marry. Dr. Sequeira held that if he were rendered non-infective for a certain period it would be safe for him to marry from the point of view of risk of infection to the wife and any progeny there might be; but that, from the life-assurance point of view, he was a damaged man, and so his expectation of life could not be said to be so good as if he had not had the disease. That man might, at some remote time, develop some symptoms, but it was necessary to differentiate that possibility from active likelihood of infection of wife and children.

Could a man whose positive W.R. could not be changed by treatment be allowed to marry? He thought there might be too rigid a standard. It was a question of prolonged treatment, and he had advised in cases of this type that at regular periods during married life the patient should undergo treatment, and he had seen normal children from such marriages. The experience of others in such cases would be valuable. Sir Jonathan Hutchinson allowed marriage after only two years of continuous treatment by mercurial pills, and in a large number of cases that course proved safe. Dr. Sequeira had known men who underwent that course and whose families were healthy. He agreed it was important to have a high standard, but in certain circumstances its enforcement was a considerable hardship. The best course was to explain both the infectivity side and the life-expectation side to both parties, and in most cases that could be done. It was very uncommon to come upon a case of knowing or deliberate infection, and among the educated classes such was practically unknown. Constantly, also, among the patients who came to the London Hospital were men who years before had run the risk of infection, and when contemplating matrimony came to make sure that they were not infected.

Three Groups of Cases.

Dr. H. C. SEMON said that his experience of women at out-patient clinics did not coincide with that which Dr. Routh expressed, for he found that women were more conscientious in their attendances than were the men. He wished to put forward three groups of cases from the point of view of marriage. The first were those having a chancre only, in which the W.R. had not become positive, and no secondaries had developed. If these, after a year of careful observation, preserved their negative W.R., he agreed they might be considered as cured. He had not seen or read of a case which was negative to start with, continued so, and after a year of observation developed a positive W.R. A patient in this group might reasonably be permitted to marry in 18 months. The difficulty was when the syphilis had become generalised (group 2) and was no longer a local disease. These cases must be watched individually; no concrete rule could be laid down until the real meaning of the W.R. was known. Dr. Semon agreed with Dr. Sequeira as to cerebro-spinal syphilis; it was questionable whether a man whose cerebrum had been damaged by syphilis ought ever to be allowed to marry; he could not then be regarded as a normal person, and at any time later he might again develop manifestations in his nervous system. The question of para-syphilitics marrying did not arise; if asked whether a tabetic or a general paralytic should marry, every member of the society would at once give an emphatic negative. In group 3 he would place tertiary cases and those cases still latent after three years of thorough treatment. He agreed that such cases were no longer infectious in the great majority of cases. With the diffusion of knowledge now so general, he should in his own practice (besides continuing treatment of the husband) insist on treating the wife during the first six months of her first pregnancy at least. All statistics concurred in the success that attends rigorous antenatal measures.

A Family Practitioner's Experience.

Dr. HENRY MENZIES, invited by Dr. FOX to give the meeting the benefit of his experience as a family practitioner, said that he had seen certain interesting cases. He remembered four people who had syphilis and afterwards married and had healthy families, and then, in later years, developed definite syphilitic symptoms. One man developed ataxy,

with a positive W.R., in late married life; his wife and children remaining healthy. Another developed ataxy, with a negative W.R.; his family were healthy. One man had syphilis when he was 20, married when he was 25, and had quite healthy children. The man had no illness until he was 70, and then he developed a typical ulceration of the tongue, with mucous plaques. Another man married and had perfectly healthy children, but his wife, after his death, developed cerebral syphilis. He did not think it followed that if a man had syphilis when young, and showed manifestations of the disease later on, that his family were necessarily infected. He would like to know what was the actual merit of the various "neo-" preparations in comparison with the original ones. He had not known the former abolish a positive W.R. in any case, and his view was that the new preparations were but a feeble imitation of the real thing.

Congenital Syphilis in Children.

Dr. D. N. NABARRO said that most people were agreed that the W.R. was a very valuable test of the presence of syphilis; he thought a positive W.R. always meant syphilis, but whether a positive W.R. in a patient who had syphilis many years ago meant present syphilis in an active state was another matter. If a man had had syphilis ten years, he would, as a rule, no longer be infective to his wife or children. His experience of the disease had been obtained largely at the Hospital for Sick Children, Great Ormond-street, and therefore mainly in regard to congenital syphilis. The treatment of congenital syphilis in older children had so far been disappointing. Unless one had the patient very young, it was very difficult to procure a permanent negative W.R., if that was to be aimed at as an indication of cure. He had given 40 to 45 injections to children without favourably altering the W.R. at all in some cases. Nevertheless, their general condition was often much improved by the treatment. If the children could be seen within the first few months of life, then one or two courses of treatment by injections of arsenic and with mercury would render the W.R. negative; in most it would remain so, and the patients would show no sign of disease. Some relapsed, and then another course of treatment again made the W.R. negative. He had had such patients under observation only for six years as yet, and that was not sufficiently long to enable him to say whether they were cured. They must be kept under observation until they were 20 years of age, or longer, before it could be said no further manifestations were likely to occur. It was not yet known whether syphilis was a life-long infection. On that account he was entirely with Dr. Routh in his advocacy of establishing as widely as possible the antenatal treatment of syphilis—namely, the treatment of the pregnant woman. If congenital syphilis could be made a notifiable disease it would help, because it would enable the profession to get into touch with syphilitic families; the mother could then be induced to undergo a course of treatment, as she could be practically promised that it would result in her giving birth to a healthy child. The mother would thus have every incentive for undergoing treatment, for it was she who had all the trouble with syphilitic babies; she had to bring them regularly to the hospital for treatment, and even then a cure could not be promised; moreover, children did not like the treatment. Dr. Routh had said that the husbands ought to be induced to come for treatment; in Dr. Nabarro's experience it was very difficult to get them to come, and often their work prevented their getting there before 6 P.M. He supposed that it must be accepted as true that when a child was syphilitic the mother also had the disease, yet he had a few cases in which the mother's W.R. was negative, even after provocative injections. One case was that of a congenital syphilitic father whose child gave a positive W.R., the mother being negative. This was the only case of the kind he had had. With regard to the question whether a mother was always syphilitic if she was once infected by her offspring, he had seen families in which the mother had had one, two, or three syphilitic children, yet from later pregnancies the children had been non-syphilitic. He thought the syphilitic virus diminished in intensity and infectivity as years progressed, and that though the mother might have been originally heavily infected and had no treatment, as the years went on she eventually had healthy children.

Dr. MORNA RAWLINS, speaking of women who gave a negative W.R. and had babies who were congenitally syphilitic, said that if one looked on ahead one would probably find that even with a negative W.R. a patient might develop some syphilitic sign or some nerve lesion. Therefore if a woman bore a syphilitic child, even though her W.R. might be negative, she should be treated as a syphilitic patient.

Dr. FOWLER WARD said he had found that if syphilitic children were treated for three years and upwards they did extraordinarily well. Many of the children had not any very definite syphilitic lesion; they had headaches and were ailing in a general way. When put on to intravenous injections they improved out of knowledge. As he was in a small town he knew the patients, and the mothers continued with the treatment for their children five, even to ten, years. With regard to the psychological effect of the injections the great point was to instil confidence. With regard to forbidding syphilitics to marry, in all the 20 years of his practice he had never been asked about the marriage of syphilitics, and from that fact he concluded that syphilologists were barely touching the fringe of the subject. He agreed with Sir James Purves-Stewart that the only way to combat this disease was by education.

Compulsory Notification.

Dr. DENNIS VINRACE accentuated the importance of encouraging patients who had suffered from V.D. to be examined from time to time by practitioners in venereal work. Such a course would spare the feelings of persons who had been infected and guide them as to their conduct and the treatment they required. Male V.D. patients should marry as early as permissible; they would do less harm to the community as married men than as bachelors. A doctor should not betray confidences; he had no right to acquaint a wife of her husband's misdoings, but he could treat the wife sub rosa. Compulsory notification of V.D. would defeat its own ends. It was only required for poor, helpless, and ignorant persons. As regards the educated and upper classes, any such provision would not only convert the doctor into a statutory policeman, and compel him to betray his trust, but deprive him of his legitimate fees. Such persons would employ chemists or quacks or treat themselves. As regards Sir James Purves-Stewart's hope that ultimately a vaccine would be discovered for the prevention of V.D., Dr. Vinrace considered that if it were provided the immorality of the community would be vastly increased.

Dr. H. WANSEY BAYLY expressed his appreciation of Sir James Purves-Stewart's statements concerning the need for the education of the public as the best means of bringing about healthy marriages. He felt convinced that concentrating effort in treating the patient after he had acquired the disease was a very inadequate means of combating the state of things. Everybody, particularly children and adolescents, should be taught that the only way to avoid contagious diseases was to avoid contact; but his experience had been that the adult was not sufficiently impressed by argument alone as to the morality of the matter, but that he was susceptible to appeals to his honour. It should be impressed upon him that it was his duty, as a citizen, if he should acquire the disease, to take such steps as would minimise the possible evil effects on innocent persons with whom he might afterwards be associated.

The Case of the Engaged Man.

Colonel L. W. HARRISON reminded members of Sir Jonathan Hutchinson's teaching, that he knew only

two instances of transmission of the disease to children by men who had followed his requirement of two years of treatment, though many of them had themselves suffered from later manifestations. That seemed to show that the transmissibility died out in time: Colonel Harrison usually advised patients to wait four or five years. In this discussion the case had not been mentioned of the man who found himself to be infected when engaged to be married: if he did not get married fairly soon, there would be a good deal of family trouble. What should be done there? Should everything be broken off because the infection seemed too recent to permit of marriage, or was there a means of preventing infection of his wife if he did marry? The effect of antenatal treatment in preventing transmission was suggestive, and he thought that, so long as a man remained actively under treatment and was reacting normally, he was very unlikely to transmit the disease, even though infection was recent. He suggested this solution of a difficulty which most doctors would admit was sometimes very real. Gennevich had recorded many cases of men who had received his intensive courses of "606" and mercury, and had been allowed to marry within two years of infection, fine healthy families having resulted. He suggested that experience might prove that after intensive treatment, thoroughly carried out, patients could be allowed to marry with safety sooner than had formerly been considered possible.

Reply to the Debate.

Dr. ROUTH said that it seemed, from the discussion, that the profession was not yet quite sure how long, on the modern methods of treatment, a syphilitic subject should be required to be treated before marrying. It almost seemed that modern methods were not so sure as those carried out by Sir Jonathan Hutchinson, but there must be a flaw in this argument. Still, mercurial treatment in 1905 sufficed to procure healthy children, and that needed explaining. It had to be carried out continuously in those days, whereas now it was thought by many that a negative W.R. meant cure, and that there was no necessity for continuing the treatment. With regard to the question whether mothers who had borne syphilitic children were always themselves syphilitic, Dr. Routh suggested that it might be assumed that with each pregnancy the woman was circulating a larger dose of the substance which kept the spirochætes quiet, so that eventually they were rendered quite inactive and she bore healthy children. He was glad to hear Dr. Nabarro emphasise the importance of treating the syphilitic mother before the birth of the child, in preference to treating, over a long period, the child after birth. He felt strongly that this was the only way to get rid of congenital syphilis.

EXHIBITION OF CASES AND SPECIMENS.

Dr. SEMON described a case of

Tabes with Recurring Herpes Zoster.

The man, aged 35, had well-marked ataxia, absent knee- and ankle-jerks. Both pupils reacted sluggishly to light; there was loss of the stereognostic and orientation senses in the left hand. The patient dated his infection from 1904, and in 1909 he was treated for diplopia. Dr. Semon had been giving him silver salvarsan, and after the third injection the patient showed him a patch of herpes on the front of the right thigh, saying that he had been subject to these recurrent eruptions for the last five years. It always appeared after a bout of pain. Dr. Henry Head had described such cases in Clifford Allbutt's "System of Medicine," stating that it was a very rare phenomenon, and that he had only seen five cases in all. With the injections now being given, the differential diagnosis between an arsenical eruption and one due to tabes became important. In this particular case the eruption had involuted completely, although a subsequent injection had since been given.

Major A. T. FROST spoke on the subject of

Thyroid Deficiency in Subjects of Syphilis.

The cases shown at the November meeting of the Society had all progressed in a satisfactory manner; those which had previously been having frequent relapses had shown no signs since, and about half of them now had a negative W.R. on the ordinary treatment, which had been taken for years before without making any difference to the reaction. Half the cases had changed from a positive to weak-positive W.R. He suggested that much of the reduced vitality in syphilis, especially in the later stages, was due to thyroid deficiency, and that the lethargy and inertia probably were due to infection of the ductless glands, the thyroid among them. One case had relapses two or three times in three years, though all the time he was having fairly intensive courses of treatment. Eventually he showed jaundice, and later erythema as a result of the treatment with arsenic. The speaker then found signs of thyroid inefficiency, and put him on thyroid treatment. Following this, high doses of arsenical compound were renewed, and no sign of arsenic intolerance has occurred. Arsenic alone did not attack the organism of syphilis, and he thought there must be a substance in the blood increased or stimulated by the ductless glands secretions, which, uniting with the arsenic, operated efficiently on the disease without organotropic effects from the metal, if this substance is in sufficient quantity. He commended the suggestion for study by the Society.—Dr. FOX said that the matter should be followed up. A series of cases should be treated with thyroid at the same time, so that statistics could be compiled.—Dr. FOWLER WARD said a man with tertiary ulceration of the shin had not made any progress on the ordinary N.A.B. treatment, but since he had been having thyroid (as suggested at a former meeting), though the W.R. had not become negative, healing had been quite rapid.—Dr. SEQUEIRA asked if any member had had experience in the treatment of syphilis in myxœdematous patients.—Dr. NABARRO said he had had cases of children who had had as many as 40 injections and yet retained positive W.R. throughout. Since, at the last meeting, it was suggested that these stubborn cases might be due to some of the glands not acting properly, some patients were tried on thyroid, some on parathyroid, some on mixed-gland extract, and there had been encouraging results. One case which had a positive W.R. for 14 years had now become negative. In addition, one or two of the children were now mentally brighter.—Dr. H. M. HANSCHELL said that at the meeting in November he was much interested in this subject, and at that time he had in hospital a lascar who had had a relapse, and mercurial and neokharsivan treatment had no apparent effect on him. He could not find that the man lacked thyroid secretion; he was hairy, and in every way fit. He had a persistent rash and an unhealed chancre. He was given thyroid and the whole condition cleared up.

Gumma of Tongue.—Gumma of Right Calf.

Dr. VINRACE showed a case of gumma of tongue of four months' duration in a man aged 50. He was a platelayer and had contracted syphilis at the age of 29. It was treated for the following two and a quarter years and apparently cured. No more treatment nor symptoms occurred till November, 1922. In February, 1923, he attended St. Paul's Hospital with ulcer of tip and adjoining edge of the tongue. W.R. ++. At the age of 38 he had become the fourth husband of a widow then aged 40. She died of G.P.I. ten years after the marriage; there was no pregnancy; history of the three previous husbands was not available. An alternative diagnosis of epithelioma and biopsy was suggested by Dr. Sequeira.

Dr. VINRACE also showed a case of gumma of the right calf of six months' duration in a man aged 51. He had been married for 30 years, contracted syphilis eight years ago, and had had no coitus since then. He was treated for a few months following infection and then had no treatment for some years. In April,

1922, he attended St. Paul's Hospital for three weeks with numerous tertiary ulcers of six or eight weeks' duration. In March, 1923, he attended St. Paul's Hospital again. Numerous cicatrices on right arm and forearm, on the lower thigh, and upper knee and ankle, and a large deep gummatous ulcer on the right calf.

Cases.

Dr. FOX showed a case of double infection and one of primary sore inside the lip.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW

A MEETING of this Society was held on April 6th, Dr. T. MORRIS CRAWFORD, the Vice-President, in the chair, when a discussion took place on the

Diagnosis of Pulmonary Tuberculosis, with Special Reference to Radiology.

Dr. LEONARD FINDLAY referred particularly to the malady in the young, and stated that his conclusions were based upon clinical, radiological, and pathological examination of the material, and that meticulous care had been taken in the matter of diagnosis. Dr. Findlay's belief was that in the ante-puberty period of life tuberculosis of the lungs is a disease of infancy and early childhood, and that it runs an acute or subacute course. In an older child a pulmonary lesion, and especially a chronic pulmonary lesion, should be diagnosed as of a tuberculous nature only with the greatest hesitation and in the presence of the utmost proof. Charts were shown in support of this thesis. Dr. Findlay also pointed out that pulmonary tuberculosis, unless in the very young infant, is seldom, if ever, limited to one lung or one lobe of the lung.

Dr. D. CAMPBELL SUTTIE explained how difficulties arose with regard to the interpretation of X ray films, and showed films of cases of pulmonary tuberculosis. Dr. Suttie's conclusions were: 1. Admittedly recognisable X ray appearances have a definite value in the face of negative clinical findings. 2. Negative X ray appearances have no claim for consideration when clinical signs are undoubtedly present. 3. There are pathological conditions which in their early stage are undetectable by either—e.g., miliary tuberculosis. 4. Certain pathological conditions are shown by radiograms (*a*) before clinical signs or symptoms appear and (*b*) after clinical signs or symptoms have disappeared. 5. Certain pathological conditions are detected by the clinician before X ray appearances are present.

Dr. A. S. MACGREGOR introduced the subject from the point of view of the Department of Public Health, and referred to the work done by Dr. J. A. Wilson and Dr. F. L. Henderson and himself in correlating clinical and radiological features in special groups of cases. Some of the earlier ideas as to the nature and apparent abnormalities in X ray films had had to be discarded, and radiographic appearances varied within wide limits in normal chests. From the point of view of routine diagnosis of lung conditions, perhaps the most important aspect of radiology was the aid it gave in a negative sense in doubtful cases. In this respect the right apex was a constant stumbling block. It was also of value in many cases of chronic bronchitis where the symptoms suggested a coexistent tuberculosis. Reference was also made to the hidden, unsuspected, and otherwise undiagnosable lesions which X rays often detect.

Dr. J. A. WILSON, who followed, stated that if one analysed the cases notified as pulmonary tuberculosis in a district of Glasgow, it would be found that the error in diagnosis, in the best year, was about 33 per cent. For the past three years efforts had been made to evolve a scheme to deal with the increasing number of notifications of cases which were doubtfully tuberculous. While it was perhaps too early to dogmatise, the conclusions come to as a result of the combination of careful X ray and clinical work were: 1. Cases of tuberculosis of the lung have a definite radiological picture. 2. Hilus tuberculosis is an uncommon disease. 3. Basal lesions are, as a rule, non-tuberculous, the exceptions being those secondary to a chronic tuberculous infection of the abdomen. 4. There may be physical signs of moderately extensive infection of the respiratory tract with no radiological counterpart. These infections are non-tuberculous.

Dr. FERGUS L. HENDERSON gave a demonstration of X ray films and slides illustrating points in radiological diagnosis of tuberculous disease of the lung.

Reviews and Notices of Books.

TROPICAL MEDICINE.

The Practice of Medicine in the Tropics. Vol. III. By many authorities. Edited by W. BYAM and R. G. ARCHIBALD. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 960. £4 4*s*.

THE third and final volume of this exhaustive work has now appeared, some three years after the first of the series was reviewed in THE LANCET. The subject-matter is diverse: it includes sections on helminthiasis, heat-stroke, disorders of metabolism (deficiency diseases), and diseases of doubtful causation. The section on regional diseases embraces diarrhœas in the tropics, ophthalmology, and the heart in chronic tropical diseases. The last three sections are devoted to skin diseases, diseases of women, and surgery respectively. The eagerly expected section on helminthiasis is mainly from the pen of Clayton Lane, in parts in conjunction with G. C. Low. It will doubtlessly be scanned by many a critical eye, for an authoritative account of medical helminthology has long been wanting. Special attention has been paid to the nomenclature, with the result that *Dibothriocephalus latus* has become *Diphyllobothrium latum*, and the familiar *Oxyurus* converted to *Enterobius vermicularis*. It is doubtful whether the original drawings which illustrate this section will convey to the student all that he wishes to learn; to the unzoological eye sagittal sections of trematodes are apt to be misleading. An entirely satisfactory account of human helminthology, written from a medical standpoint, has always presented many difficulties, and this is an advance on any yet extant.

Schistosomiasis is treated in a lengthy article of 76 pages, which is the combined work of six collaborators—N. H. Fairley, A. R. Ferguson, H. S. Houghton, F. C. Madden, P. H. Manson-Bahr, and I. F. G. Martinez. The subject is fully illustrated with beautifully coloured plates, maps, and diagrams. Hydatid disease is discussed from a clinical standpoint by L. E. Barnett, and the surgery of this dangerous condition is fully dealt with. The chapter on ankylostomiasis is from the pen of Bailey K. Ashford. The section on filariasis, by J. W. W. Stephens and Warrington Yorke, contains a summary of the views of authorities on this subject, and the description has in places become controversial. Infection with *Loa loa* (designated *Loiasis*), *Acanthocheilonema perstans* (*Acanthocheilonemiasis*), and *Onchocerca volvulus* are also considered. Disorders of metabolism commences with a useful chapter, by E. E. Waters, on diabetes in the tropics, a subject not usually considered in books on tropical medicine. Deficiency disease, scurvy, beri-beri, epidemic dropsy, and the whole subject of vitamins is dealt with by E. B. Vedder in one of the best chapters in the book. Pellagra, beautifully illustrated, is treated by G. M. Miles. J. A. Arkwright and Sir William Willcox are responsible for the account of typhus fever, and this section, as well as that on Rocky Mountain spotted fever, by B. S. Wolbach, is excellent. An account of trench fever is given by the senior editor, W. Byam, who has already written much on this disease, while we are grateful for an authoritative and modern description of tsutsugamushi disease to the Japanese investigator Mataro Nagayo. Oroya fever and verruga

peruviana are considered together in an article based upon the original work of R. P. Strong. The section on dengue is by J. B. Cleland, while L. P. Phillips, of Cairo, deals with phlebotomus fever. Rabies is presented by W. F. Harvey and A. G. McKendrick; an excellent description of small-pox, by S. Sabongy Bey, is adorned by many telling photographs. Sprue is discussed by P. H. Manson-Bahr, diarrhœas in the tropics by J. Cunningham, and ophthalmology by R. H. Elliot. R. M. Wilson contributes a chapter on the heart in chronic tropical disease. The section on skin diseases, by A. Castellani and A. J. Chalmers, is mainly remarkable for the beautiful plates by Terzi; scabies is considered in a separate chapter by J. W. Munro. Diseases of Women in the Tropics is by Grace Mackinnon, and will be found full of useful information to the tropical practitioner, who is also well served by the profusely illustrated account of surgery of the tropics, entrusted to F. C. Madden.

The editors may be complimented on having concluded their task in so satisfactory a manner, and on having produced a monumental work which is a credit not only to the science of tropical medicine but also to the practitioner in the tropics.

Laboratory Studies in Tropical Medicine. Fifth edition. By C. W. DANIELS, F.R.C.P., Consulting Physician to the Hospital for Tropical Diseases, and H. B. NEWHAM, C.M.G., M.R.C.P., Director of the Department of Tropical Pathology and Warden of Studies, London School of Tropical Medicine. London: John Bale, Sons and Danielsson, Ltd. 1923. Pp. 576. 25*s*.

IN hardly any department of medicine is laboratory technique so essential as in the study of tropical disease; a new edition of a book already familiar to generations of students will, therefore, be welcomed. If regarded as an introduction to the subject, and not as an exhaustive presentation, it will be found adequate to its purpose, for laboratory technique is set forth in simple language and in instructive style. The general arrangement of the book in previous editions is maintained, while recent advances in intestinal protozoology and in helminthology receive attention and have necessitated the inclusion of additional illustrations. One adverse comment may be made with reference to the description of the Wassermann reaction. In a laboratory text-book a detailed and intelligible description of a rather elaborate technique might be expected. The method here advocated has not received universal approbation, and a more generally accepted method, such as the one adopted by the Medical Research Council, should have been substituted. The brief introduction to entomology which completes the volume is admirably adapted for the student.

THE TREATMENT OF FRACTURES.

With Notes about a Few Common Dislocations. Ninth edition, revised. By CHARLES LOCKE SCUDDER, M.D., Consulting Surgeon to the Massachusetts General Hospital. London and Philadelphia: W. B. Saunders Company, Ltd. 1923. With 1252 illustrations. Pp. 800. 42*s*.

AMERICAN surgery has provided us with at least three outstanding monographs dealing with fractures, not the least distinguished of these being Scudder's work which has been repeatedly revised since its first appearance in 1900. At the Massachusetts General Hospital, Boston, where Dr. Scudder himself laid the foundations of the special fracture service which functions to-day, the rising tide of abdominal surgery of the past 20 years has never engulfed this more prosaic but equally important department of surgery.

In the present edition there is the same profusion of useful illustrations and descriptions of varied methods which characterised previous issues of the book. Dr. Scudder has been more than generous to many surgeons in the full reference he has made to the technical advances of the past decade. The question remains whether it is worth while to continue to reproduce the minutiæ of so many different methods of handling and splinting limb fractures. Recent warfare experience has taught us how essential it is that there should be the utmost simplicity both in the enunciation of principles and in the application of the same. For example, in the section dealing with fractures of the femur, we fail to discover Dr. Scudder's own views based on the maturity of his experience. No doubt there are many different ways of obtaining a passably fair result in any given fracture. Many of the popular and conventional methods, however, are known to be technically unsound. Thus we regret to see in this important work the inclusion on a large scale of illustrations depicting the application of flat wooden splints.

Dr. Scudder's book will lose none of its well-deserved popularity, and the influence of the author in the direction of stimulating a better organisation of fracture treatment in hospitals will continue to be felt far and wide.

THE BACTERIOPHAGE.

Its Rôle in Immunity. By F. D'HERELLE, Pasteur Institute. Authorised translation by GEORGE H. SMITH, Ph.D., Assistant Professor of Bacteriology and Pathology, Yale University Medical School. Baltimore: Williams and Wilkins. 1922. Pp. 287. $4.50.

THIS is an American translation of d'Herelle's well-known monograph, and it is a welcome addition to bacteriological literature, since it sets forth for the first time in the English language the views and work of the author upon the remarkable phenomena now associated with his name. We have already reviewed the original, and the translation differs from it but little, except that Chapter IV., which deals with the essential nature of the agent of the phenomenon, is new. This practically sets forth the arguments advanced by the author at the British Medical Association's meeting last year, and he maintains in the face of all criticism the essential living nature of his bacteriophage. A full bibliography is given and this has been brought up to date. We note the omission of Twort's name, although his work is referred to in the text. The translation has been well carried out, but we must protest against the rendering of "Je l'ignore" as "That must be ignored."

DISEASES OF THE EAR, NOSE, AND THROAT.

Medical and Surgical. Sixth edition. By WENDELL CHRISTOPHER PHILLIPS, M.D., Professor of Otology, New York Post-Graduate Medical School. Philadelphia: F. A. Davis Company. 1922. Pp. 881. $8.

THIS work is a well-known standard text-book in the United States. The first part, on diseases of the ear, forms nearly one half of the entire volume; it is well written, beautifully illustrated, and full of helpful detail in just those difficult minutiæ for which the practitioner will wish to seek its advice. We have not read anywhere a more lucid description of the intricate subject of testing the function of the vestibular apparatus. Immediate closure of the wound after antrotomy is described under the so-called "blood-clot" method of after-treatment; the author says that "unfortunately the results have not seemed to warrant its general employment," but he makes no mention of immediate suture after sterilising the cavity with alcohol and bipp, a method which has given excellent results in this country. He recommends the practice, in thrombosis of the lateral sinus, of removing the clot located in the jugular bulb with a curette before ligature of the jugular vein, a manipulation which would appear to be highly dangerous. Apart from a few such points, we have nothing but praise for this section of the book. The remaining part is divided into a section on general diseases, including tuberculosis and syphilis, and a final section on diseases of the nose and sinuses, pharynx and fauces, and the larynx. By comparison with the section on the ear, the

remainder, especially the part on the larynx, is somewhat disappointing; it lacks the sure touch and fullness of practical detail marking the former part.

Important subjects are dismissed too quickly for a book of this size; for instance, only five lines are devoted to the surgical treatment of naso-pharyngeal fibromata. The chapter on the diagnosis and treatment of cancer of the larynx is particularly disappointing; of operative methods the author recommends complete laryngectomy for practically all operable cases, and states that laryngo-fissure "can rarely be employed because it is applicable only to cases where the disease is limited to an extremely small area." He mentions a case where the entire diseased area covered less than one-half of the vocal cord; nevertheless, a hemi-laryngectomy was performed, and the patient survived for 14 years. In this country the operation selected would have been laryngo-fissure, the prospect of recovery would have been as good, and the mutilation much less. Dr. Phillips has entirely neglected the brilliant work done in England by Butlin and Semon and their successors. In fact, throughout the book very little reference is made to workers outside America, a fact which, however, is made the subject of a prefatory warning.

PEDIATRICS.

Edited by Prof. E. FEER, Director of the University Children's Clinic, Zurich. Translated and edited by JULIUS PARKER SEDGWICK, B.S., M.D., Professor of Pediatrics, University of Minnesota Medical School; and CARL AHRENDT SCHERER, M.D., F.A.C.P. London and Philadelphia: J. B. Lippincott Company. 1922. Pp. 917. 42*s*.

THIS large volume should be valuable to those to whom the original German edition is not available. Such well-known writers as Finkelstein, von Pirquet, and Noeggerath are responsible for various sections, which have been translated and edited by American physicians. We regret that the German phrases, even though ponderous, have been rendered in colloquial English, if not actually slang, unsuitable to a text-book. For the rest, though we may hope that the student will still prefer the succint clinical pictures of the great British teachers, whoever turns to this volume cannot fail to find a mass of valuable knowledge and a very thorough survey of the subject.

ORGANIC CHEMISTRY.

A Method for the Identification of Pure Organic Compounds by a Systematic Analytical Procedure Based on Physical Properties and Chemical Reactions. Vol. IV. By Dr. S. P. MULLIKEN, Associate Professor of Organic Chemical Research at the Massachusetts Institute of Technology. London: Chapman and Hall. 1923. Pp. 238. 30*s*.

THE fourth volume of this work constitutes a comprehensive record of an arrangement of organic compounds whereby their identification is facilitated. With the publication of this volume the most important portions of the special analytical field with which the "Method" is concerned are so far covered that the chemist who is engaged in the identification of any well characterised, pure organic compound may turn to its tables with at least a reasonable hope of assistance in the solution of his problem, provided the compound has been previously described and possesses some apparent general interest. Volume IV. adds to the "Methods" 14 "orders" or groups of compounds containing new combinations of elementary atoms, and about 3900 additional specific characterisations to the previously completed descriptions. The selection of compounds is the result of a scrutiny of the entire list of compounds mentioned in the last completed edition of Beilstein's "Handbuch" and of the first three volumes of the edition now in progress of publication, and also includes many other species of evident interest described in the more recent periodical literature.

The greatest care must have been exercised in the compilation of this monumental work, and organic chemists are indebted in no small degree to the author and his associates.

Richter's Organic Chemistry. Vol. III.: Heterocyclic Compounds. Translated from the eleventh German edition by G. E. F. D'ALBE, D.Sc. London: Kegan Paul, Trench, Trübner and Co. 1923. Pp. 326. 25*s*.

THIS third volume completes the translation of the eleventh German edition of the well-known Richter's Organic Chemistry as edited by Anschutz and Meerwein. It deals in a systematic manner with 3, 4, 5, and 6 membered heterocyclic compounds. The vegetable alkaloids of the pyridine, tropine, cinchonine, morphine, and isoquinoline groups are treated in a fairly comprehensive manner from the structural point of view. It is to be regretted that in most of the references to the published literature the number of the volume only and not the year is given. This lapse in a standard work is to be deplored.

NURSING OF DISEASES OF THE EYE.

A Simple Treatise for Nurses. By JESSIE ELMS, A.R.R.C., Matron, Sussex Eye Hospital, Brighton. London: The Scientific Press, Ltd. 1923. Pp. 70. 2*s*. 6*d*.

OF the 70 pages in this book only 13 are devoted to the subject of practical nursing, the rest being an elementary account of the anatomy of the eye, and a list of instruments used in eye operations. Nurses are creditably hungry for knowledge, but we fear that many of them will rise from the perusat of this manual with an unsatisfied appetite. The chapter on methods of treatment is good, so far as it goes, but would be much better if more information were given on the dangers of some of the drugs in common use, and the best methods of avoiding these—we refer more especially to atropine irritation and the roughening of the cornea which follows the careless use of cocaine. The hints about food in the days succeeding an operation for cataract might well be supplemented by details of the food actually given in an eye hospital. As to theatre work, an ophthalmological surgeon would not care to operate with the sole assistance of a nurse whose teaching on the subject was confined to that enunciated in this little book.

THE URETHRA AND THE URETHROSCOPE.

By F. CARMINOW DOBLE, M.R.C.S., L.R.C.P. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 120. 10*s*. 6*d*.

THE increase in venereal disease associated with the war has brought with it a flood of new books on the subject of its diagnosis and treatment, and during the last three years a great many reviews of new text-books on venereal subjects have appeared in these pages. With the exception, however, of Luys's "Cystoscopy and Urethroscopy" and a small manual by Dr. Norman Lumb, few books written in the English tongue have devoted themselves to the subject of urethroscopy. This little volume by Dr. Doble deals entirely with urethroscopic methods of diagnosis and treatment. Lesions of the urethra and their pathology are only described in so far as they have a bearing on urethroscopy, and the only methods of treating chronic gonorrhœa given are those which are applied through a urethroscope. The first portion of the book is devoted to descriptions of different models of anterior urethroscopes, all of these, with the exception of Luys's and Vallentine's, instruments being of British design and manufacture. Amongst urethroscopes for the posterior urethra the author includes descriptions of the Wossidlo-Goldschmidt, Luys, Wyndham

Powell, and Swift Joly instruments. In addition to these is a special adjustment designed by himself which may be fitted to the anterior urethroscope, manufactured by the Holborn Surgical Instrument Company. This consists of a long, straight tube, an elbowed obturation to facilitate its introduction into the posterior urethra, and a longer lamp bracket so that the illumination may be brought to the end of the examining tube. Dr. Doble apparently does not consider that water distension is an essential to satisfactory vision in the posterior urethra, and here there will be many who will join issue with him. The descriptions of the different instruments are clear and precise. The work, moreover, has been well illustrated and contains, in addition to drawings of instruments, coloured plates showing the commoner lesions of the anterior and posterior urethra. It is certainly the best guide to urethroscopy that has appeared from the pen of an English writer, and its general get-up and finish are excellent.

JOURNALS.

QUARTERLY JOURNAL OF EXPERIMENTAL PHYSIOLOGY. Edited by E. SHARPEY SCHAFER and others. Vol. XIII. No. 1. Pp. 1–103. London: Charles Griffin and Co., Ltd. 10s.—The Action of Extracts of Endocrine Glands upon Motor Nerve and Skeletal Muscle, by Misao Yoshimoto. Extracts of the pituitary body—anterior and posterior lobe—pineal gland, brain matter, thyroid, parathyroid, thymus, suprarenal, testicle, ovary, and also choline hydrochloride, histamine acid phosphate, tyramine acid phosphate were applied to the isolated nerve and to the sartorius muscle of the frog. The results show that there is but little reason to suspect any specific physiological effect of the endocrine glands on motor nerve or striated muscle. The restoration of nerve function in Ringer's fluid after being affected by these substances is generally complete, while that of muscle is not uniformly so.—The same author describes the Action of the Blood Serum of Animals in Tetania Parathyreopriva on Motor Nerve and Skeletal Muscle. The frog's sciatic nerve and sartorius were used. The serum of thyreo-parathyroidectomised dogs and cats produces some increase of excitability in the isolated nerve of the frog, but has no special effect on the contraction of isolated muscle. The serum of both thyroidectomised and normal dogs and cats has practically no effect on frog's nerve. A solution of guanidine carbonate causes some increase of nervous excitability. Taken in conjunction with the results of other workers on tetany, the author concludes that the serum of animals in a condition of tetania parathyreopriva may contain some exciting substance which is present in just sufficient amount to affect the excitability of motor nerves, but not of muscles. Some guanidine-like body may be the agent in producing the hyper-excitability of peripheral motor nerves in tetany.—Effects of Lowering the Temperature in Homoiothermic Animals, by S. W. Britton.[1]—A Method for Recording Gastric Secretion in Acute Experiments on Normal Animals, by Robert K. S. Lim. The most suitable animals are cats and dogs, especially cats, and the experiment is best performed on chloroformed animals at or shortly after the time of the usual morning meal, a procedure which ensures that the stomach is empty and that the glands are in a normal state of repletion. A perforated glass cannula is introduced into the stomach through the pylorus to drain the stomach of its juice, which is allowed to activate a drop-recorder after its escape from the organ. A balloon is also inserted into the stomach to serve as a control of motor changes. The method permits of observation being made on the latent period, and the duration and quantity of the secretion after the introduction of a suitable excitant. The juice thus obtained invariably contains free HCl and pepsin.—The Question of Gastric Hormone, by Robert K. S. Lim. Using the method just described, extracts of the fresh organs employed were administered through the external jugular vein of cats. The author confirms the observations of Edkins regarding pyloric extracts and their effects in causing gastric secretion. Extracts made from the cardiac and duodenal mucous membranes are less active; fundus extracts are comparatively inert, while jejunal and ileal extracts are ineffective. Histamine causes gastric secretion when injected intravenously. Adrenalin does not inhibit the secretion provoked by the substances named, but may delay outflow from the stomach. Adrenalin excites secretion in some individuals. The distribution of the gastric excitant or gastrin in the stomach and duodenum corresponds with the distribution of mucoid glands; it is suggested that the excitant is extracted from mucoid cells. The blood of fed animals has no effect on gastric secretion when transfused directly or indirectly. Since there is no exciting substance in the blood after meals, it is concluded that the excitant found in the pyloric and other extracts is not secreted into the blood-stream, and the mechanism of secretagogue action is not due to internal secretion.—Does the Depressor Nerve Contain Efferent Fibres? E. Sharpey Schafer and M. L. Walker find that the depressor contains no efferent fibres, but is purely afferent.

[1] We comment on this paper in our annotation columns.

ARCHIVES OF INTERNAL MEDICINE. March, 1923.—J. H. Means and G. W. Holmes (Boston) report two series of cases showing the effect of Rontgen ray treatment of toxic goitre. Cases of toxic adenoma and exophthalmic goitre are dealt with and evidence is produced of the beneficial effect of X ray therapy. The report is one of a series emanating from a thyroid clinic in which there is close coöperation between internist, surgeon, and radiologist.—L. Kessel, C. C. Lieb, and H. T. Hyman (New York) describe the clinical course of exophthalmic goitre based on the observation of 50 fully developed cases. A uniform plan of treatment was adopted; it consisted of rest, high caloric diet, the best obtainable hygienic and psychic conditions, and the administration of syrup of ferrous iodide. A marked tendency to recovery, sometimes interrupted by relapses, was observed.—W. J. Kerr and G. C. Hensel record observations on the cardiovascular system in thyroid disease, with special reference to the types of irregularity revealed by means of electro-cardiograms and polygraph tracings. Of the 181 goitres studied, 123 are classified as adenomas and 58 as hyperplasias. Auricular fibrillation or flutter was present in about one-third of all toxic cases. Prognosis and treatment are discussed.—L. E. Viko, H. M. Marvin, and P. D. White (Boston) contribute a clinical report on the use of quinidine sulphate. They show that the response to quinidine is better in recent cases and in those without circulatory congestion, and it is less likely to be permanent in those with ectopic beats. Sex, age, valvular disease, and, in regard to the nature of the disease, arterio-sclerosis compared with rheumatism, are not factors which determine the response to quinidine.—N. C. Gilbert (Chicago) shows the increase of certain vagal effects with increased age.—E. P. Carter and H. J. Stewart: Studies of the Blood Gases in a case of Paroxysmal Tachycardia. Marked decrease of the oxygen saturation and extremely low carbon-dioxide content of the arterial blood and low oxygen saturation of the venous blood were found.—W. L. Rogers (San Francisco) contributes a note on the correlation of vital capacity with stem height.—A case with enlargement of hæmal nodes is reported by M. Lederer (Brooklyn).—A case of rheumatic fever with cerebral symptoms simulating encephalitis lethargica is reported by L. F. Frissell (New York).—W. J. Fetter (Pittsburg) describes a gravimetric method of estimation of phosphates in the blood, and discusses their retention in nephritis.—M. Bodansky and M. D. Levy (Galveston) discuss some factors influencing the detoxification of cyanides in health and disease.

THE LANCET.

LONDON: SATURDAY, APRIL 21, 1923.

CONTRACT MEDICAL PRACTICE.

INCREASED remuneration is the only point in favour of the panel system. This is the conclusion reached by an experienced practitioner in a rural area, whose interesting letter we print on p. 819. He is comparing the present medical service under the Insurance Acts with the old club system, more especially that of the friendly societies before the year 1911, and his letter deserves careful thought at this juncture. It is an able, sympathetic, and humane statement from one with understanding. We would suggest, however, that the advantage of the capitation basis of payment lies not so much in the amount of the remuneration as in the manner in which it is paid. When the medical benefit clauses of the first National Health Insurance Act came into operation the doctors in each insurance area were asked to choose the method by which they were to be paid. The great majority chose the capitation system, only a few areas adopted payment per attendance, and all of these, after the experience of one quarter, gave it up in favour of capitation with a single exception—namely, the Manchester and Salford area. In the light of the experience now gained, the virtues of the capitation system can be set out thus. The system fixes the responsibility of the practitioner for certain insured persons on his list. The practitioner takes the risk for providing medical treatment for those of his insured persons when they fall ill. The amount of illness varies with the character of the industrial population in the neighbourhood, with the housing conditions and other economic factors due to fluctuations in trade. The risk is correspondingly greater if these conditions are bad, and it is to the doctor's interest to help in improving the environment and conditions of life of the industrial population in his midst. To the insured persons who are ill he can give unrestricted attention, concentrating on the medical aspect of the case without any anxiety as to the financial position of the patient, or any fear of an unpaid bill. He can within the range of human possibility and endurance give them his very best. In regard to those who are not ill but who consult him for trivial or incipient illness, he can interest himself in their personal hygiene, in the nature of their employment, and in their mode of living, and so do real preventive public health work. The commercial side of his practice comes less and less into evidence and the professional side gains more and more in importance. The fixed remuneration enables the practitioner to live in comfort and gives him a wholesome sense of security.

The dangers of the capitation system are those of any system of insurance payment. It provides the scope and, in certain cases, the incentive for the practitioner to neglect his work. It encourages him to get through the necessary work hurriedly and perfunctorily and teaches him to avoid all unnecessary work. This is true of the unprincipled man who is shirking his responsibilities and from whom nothing but shoddy results could be secured by any method of payment. It is also true of the victim of circumstances who lives in a neighbourhood understaffed with doctors, and who has to accept greater responsibilities than he can cope with either mentally or physically. But the same will hold true by the payment per attendance system under similar conditions. The one advantage claimed for the Manchester system is that it would secure adequate medical attention and make neglect impossible; but it cannot and does not prevent the unprincipled man from multiplying his attendances and visits and reducing each attendance to the most perfunctory service given in the minimum of time. The grave disadvantage of such a system is that the practitioner is not so concerned to keep his patients well; he is deprived in some measure of his interest in the health of the community. To abolish the capitation system would be to exclude the practitioner from the field of preventive medicine.

In contrasting the panel system with the club practice of olden days our correspondent writes: "We dealt with brothers then, we deal with material now." But is the change in the doctor or in his patients? True the old club members were thrifty and provident, while the insured person may be the unwilling contributor to a scheme which he appreciates only in so far as it gives him something tangible in return. Thus he is out to get all he can and to get it in the most material way. He has no sense of assisting in any great scheme to help his invalid comrade. In truth, he has no brother, because he has lost all sense of brotherhood. These people may make themselves seen and heard; there is no evidence that they constitute the majority of insured persons. On the professional side men without any real concern for the public weal and with a poor sense of their own obligations are to be found. They were in the medical profession before the Insurance Acts were passed, but the panel system has brought them into the light. By education and by discipline we may hope to temper these inimical factors. Much may be expected from the new generation of medical men and women, trained in social welfare. The panel system has weathered the storms of a great war and is now contending with the equally severe trials of an unsettled peace. It has great and undeveloped possibilities as an instrument of public health. Private practice will not and should not be superseded by it; there will always be abundant scope for individual practitioners, but the urgent need of the moment is for an army of practitioners of preventive medicine; this the panel system provides, and provides also, if its potentialities are properly recognised, for inter-professional coöperation in every direction. This country is now too urbanised to make possible any return to the actual conditions which RUSTICUS has recalled to memory, with their charms and their drawbacks. But there is nothing to prevent a return to the spirit which infused these conditions in the countryside, save a vague but prevalent distrust. And for the growth of this, unfortunately, the immediate future will furnish a fruitful soil. The approaching responsibility on the Ministry of Health is a very serious one.

DRUG RESEARCH IN INDIA.

INDIA has played a large part in research and discovery in the field of tropical medicine. LEISHMAN, ROGERS, ACTON have left indelible marks on medical history. An organised attempt is now being made to perfect the Calcutta School of Tropical Medicine.[1]

[1] THE LANCET, April 7th, p. 728.

One branch of the work suitable for the school was advocated by CHOPRA and GHOSH in a recent lecture before the Medical Section of the Asiatic Society of Bengal—namely, research in Indian indigenous drugs. The work which ACTON, working in India, has done on cinchona may be extended to Indian drugs. To the layman estimating the value of the medical profession nothing is more astonishing than the fact that the doctor does not know if many of his drugs act or not; further, this ignorance does not apply only to harmless but also to potent ones: belladonna, which for years has been given to suppress lactation, is now said to have no action on a gland which has hormone and not a nerve activity; morphine, which is given in suppository form after rectal operations, is now known to have no local action. While much exact experiment has been done on synthetic drugs, less has been done on galenical preparations. The work is laborious, the results are small. We have only to look at the excellently illustrated medical botanies of a hundred years ago to realise how nearly all our plants have been used medicinally; any one of these botanies will, in fact, form a good modern guide to the flowers of the field.

India, too, has used and is using many of its plants for medicinal purposes, but there is more hearsay and less experiment in its choice than in Western countries. In the lecture referred to suggestions are made as to lines which research may follow. First, there are new drugs to be discovered and new uses to be applied to old ones. It is interesting speculation to consider, if all our useful drugs—opium, belladonna, cinchona, caffeine—were suddenly forgotten, whether they would be rediscovered, and how soon. Probably there are others just as potent which have never come to light, and possibly they are without drawbacks which our present drugs possess. Others may have actions more potent than those for which we now use them; digitalis was long used for certain forms of epilepsy before it was reintroduced for dropsy, and it was by exact clinical work it was found to be effective in cardiac dropsy. In all the rich foliage of India, in all the herbs used by the wise men of India, some new preparations are to be found as soon as scientific search is made. Secondly, money can be saved by substituting drugs found at home for better-known imported ones; this is a matter of moment in a country with many of its inhabitants so poor that they cannot afford to buy common drugs such as quinine, castor oil, and magnesium salts. The powdered flowers of a variety of *Artemisia maritima* which grows in the Himalayas is said to form an excellent substitute for the expensive santonin; this is the active principle of the Levant wormseed, a variety of plant which grows in the wildest parts of the Russian steppes and which has so far been the only one known to produce the active principle. Several of the medicinally active species of strophanthus are indigenous to tropical India, and many indigenous members of the Ipomœa family contain jalapin and convolvulin.

The action of drugs can be tested scientifically and exactly only when active principles have been extracted, but when once this exact knowledge has been attained the use of crude drugs is the keynote of cheapness; the use of cinchona febrifuge, a crude drug preparation, works, as shown by ACTON, both for efficiency and economy as compared with quinine. But the scientific examination of drugs is a laborious process in which the chemist plays as important a part as the medical man. It would be well, then, for research to be started on plants to which folk-lore ascribes healing power in definite diseases. No better example of this can be given than the discovery and application of ethyl ester of hydnocarpic acid, the active principle of chaulmoogra oil, which has put the treatment of leprosy onto a sound basis. Indian pharmacology has a great future, and the Indian student should welcome the responsibility of the accompanying researches.

PRESERVATIVES IN FOOD.

THE use of chemical preservatives and colouring matters in food has long attracted the attention of public health authorities. In the year 1899 a Departmental Committee was appointed to inquire into the whole subject, and after more than 4000 samples of foodstuffs had been analysed at the Government laboratory a report was issued in 1901. It then appeared customary to add preservatives to a large number of food commodities: Salicylic acid or formalin in the case of cream; boric acid in the case of butter, margarine, bacon, and preserved meats; boric acid, salicylic acid, or sulphites in the case of jams, lemon juice, and non-alcoholic drinks. Cheese, condensed milk, lard, preserved fish and vegetables, sugars, and spices were found to be free from preservatives. The amount of preservative ranged widely: Boric acid in meats from 15 to 66 gr. per pound, salicylic acid in drinks from 1·5 to 19 gr. per pint. While this much was ascertained, there was a feeling among experts at the time that the total extent of the practice was not revealed to the Committee, inasmuch as many commodities were not sampled by the officers of local authorities. The Departmental Committee made certain definite recommendations—namely, the absolute prohibition of formalin in any form and of all preservatives in milk, and the restriction of salicylic acid and boric acid within prescribed limits. They were of opinion that salicylic acid when added should be declared to the purchaser, and that no preservative whatever should be added to foods intended for invalids or infants. The report was circulated and attracted wide attention but, in the easy fashion of the time, was not embodied in legislation. The only official action taken on the recommendations was the issue of the Cream Regulations (1912 and 1917) limiting the amount of boric acid or hydrogen peroxide which might be added to cream, and making obligatory an announcement on the label.

And so the position has remained until now. Two London medical officers of health have recently advised their public health committees that something more should be done. Dr. C. W. HUTT (Holborn) points out that in the 20 years or more which have elapsed since the Departmental Committee reported considerable scientific progress has been made, and that it would be reasonable now to enforce a declaration of the presence and amount of any preservatives added to food and to set up definite maxima which must not to exceeded. The action of sanitary authorities is now hampered by the conflicting views on the use of preservatives. A case recently taken before a Metropolitan police magistrate, in which 2 gr. of salicylic acid per pint were shown to be present in a drink, was dismissed with costs, although it is believed that salicylic acid in this small quantity may have injurious effects on digestion. Local authorities can at present only take legal proceedings against the retailer, although it is in most cases the manufacturer who actually adds the preservative. The recommendations of the Departmental Committee have been regarded in certain quarters indeed as establishing a sort of right on the part of food dealers to add chemicals. Dr. REGINALD DUDFIELD

(Paddington) reports that the routine addition of any chemical preservative to foodstuffs is unnecessary in these days of rapid transit, and would limit their use to special cases under stringent regulation. While admittedly the quantity of any drug used for preserving, taken with one food, is likely to fall below the toxic dose laid down by the Pharmacopœia, nevertheless the effect of preservatives on the digestive tract may still be deleterious. The action of some of these is known to be cumulative while individuals are intolerant to others, and their effect is especially liable to fall on sick persons and young children. Moreover, the danger is always present that preservatives may be used to disguise incipient putrefactive change or to counteract the results of lack of care in preparation. It would be easy, as Dr. DUDFIELD points out, to construct an imaginary meal which should contain an amount of preservative much in excess of the pharmacopœial dose of the drug used.

Evidently the time has come when further inquiry is advisable into the subject of preservatives in food, particularly in view of the wider use made of many of the articles since the 1901 report. The Ministry of Health has already, of course, power to make regulations under the 1907 Act, but the hands of the Ministry would be strengthened by exact knowledge of the effect of adding preservatives (*a*) on the food itself, with special reference to vitamin content, and (*b*) on the consumer. An investigation of this nature might be referred to the Medical Research Council with liberty to make inquiry as to methods of preserving food other than the addition of chemicals. A number of manufacturers now use no preservatives, and the ignorance among those who do use them as to the quantity required is pertinently shown by the wide range of a table published in Dr. DUDFIELD'S report, where he summarises the replies received from 95 sanitary authorities. At present control of preservatives is too largely dependent on the views of individual magistrates, some of whom take up an enlightened attitude, while others are apparently indifferent to the risks involved. The uncertainty whether magistrates will accept or reject the recommendations of the Departmental Committee has paralysed the efforts of sanitary authorities to the extent that in five administrative counties and 13 county boroughs no sampling whatever has been done for the discovery of preservatives during recent years. We are indebted to these two medical officers of health for pressing upon the community a matter of great importance to the public health.

THE TEACHING OF OBSTETRICS AND GYNÆCOLOGY.

AN addition to the series of Reports on Public Health and Medical Subjects, which is being published at intervals from the Ministry of Health, is written by Dr. Janet Campbell, senior medical officer for maternity and child welfare to the Ministry, and consists of notes on the arrangements for teaching obstetrics and gynæcology in the medical schools. This is the first time that a complete review of the subject has been published, and our readers will find it a valuable survey. They must be familiar with the numerous criticisms which have been recently, and many of them justifiably, passed upon the methods of instruction in these subjects, and we propose to deal at length in a forthcoming issue with Miss Campbell's conclusions and recommendations.

Annotations.

"Ne quid nimis."

TRAVEL AND INFECTION.

THE U.S. Public Health Service *Bulletin*, No. 129, on Communicable Diseases and Travel, written by Dr. Thomas R. Crowder, contains matter useful for the education of the public in modern ideas of how infection is spread. In an introduction, Dr. Victor Heiser emphasises the change in the problem brought about by swift steamships, trains, and airships, and alludes to Dr. Crowder's long experience in railway and steamship sanitation. In an appendix are given the Interstate regulations, promulgated by the Secretary of the Treasury, governing the transportation from State to State of persons infected with communicable diseases. In 1920 a Standard Railway Sanitary Code was approved by the U.S. Public Health Service and recommended for adoption by all the 48 States. Up to the present 20 States have adopted it. This is an important step towards uniformity. Briefly, the regulations forbid the travel of persons suffering from plague, cholera, yellow fever, typhus fever, and small-pox, and allow persons suffering from other infectious diseases to travel under proper supervision. Putting aside tuberculosis and venereal diseases, proper supervision means the conversion of one part of the train into an isolation cubicle with a skilled attendant in charge of the patient, and adequate arrangements for dealing with infectious discharges and food utensils, and for cleansing the improvised "hospital cubicle" after use. It is obvious that conditions are quite different with us and that the need for persons ill with infectious diseases to be conveyed by train very seldom arises in our densely populated country, since infectious diseases hospitals are everywhere within easy reach by motor ambulance. In discussing the reasons for the regulations, Dr. Crowder deals with many points of universal interest. For example, "fomites" are relegated to a place of small importance, and contact with infected secretions while they are still fresh and virulent is regarded as the essential danger. Dr. Crowder points out, however, that "to control the habits of the individual to the end that he may not contaminate with his secretions the things that are about him is a very difficult matter." Dr. Crowder shows that the travelling of consumptives in search of a climate that may cure them is a serious consideration. The National Tuberculosis Association estimate that annually 10,000 consumptives who are hopelessly diseased go into the West to die. Many other hopeless cases return home to die from the West. Many travel about from one resort to another. Dr. Crowder does not think the danger is great either from the "spray" of a tuberculous traveller or from the car and its furnishings after the tuberculous traveller has left it; the danger is greatest to children from their exploring habits and consequent hand-to-mouth infection. Statistics in the U.S.A., so far as they go, show lower tuberculosis death-rates among the railway employees on passenger trains than among those on freight trains. It appears that the things to be avoided are large doses of tubercle bacilli and their frequent repetition.

The regulations of the Standard Railway Sanitary Code apply to pulmonary tuberculosis and prescribe the use of a sputum cup, gauze paper for coughing into, a bag for soiled paper, the obligation to destroy this paper afterwards, and so on, but obviously the carrying out of these precautions depends upon the sanitary conscience of the tuberculous traveller. Lepers may travel with an attendant and under the usual isolation restrictions provided they have a permit from the Health Department of the States from which and to which they are travelling. Notified cases of venereal disease require permits, chiefly for the purpose of securing continuity of treatment. In discussing the danger from syphilitic sores, Dr.

Crowder says that the common drinking cup and common towel "now fortunately belong to the past." That is not so in this country, and common towels may still be seen in the lavatories of London hotels and restaurants of quite good standing. Dr. Crowder thinks the transmission of venereal disease by the toilet seat is probably a rare occurrence. The regulations in America have to make provision for cases of infectious disease discovered en route, perhaps on long journeys and far away from a hospital. Owing to the prohibitive cost and the very different circumstances obtaining in this country, arrangements for the travelling of persons suffering from ordinary infectious diseases are hardly likely to be made, but this *Bulletin*,[1] as a statement of the modern view as to how infection is spread, is well worthy of perusal.

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE TEACHING FOR LONDON.

AT a meeting of the Fellowship of Medicine, held on April 13th at the Royal Society of Medicine, a scheme brought forward by the non-undergraduate hospitals in London was accepted and immediate steps will be taken to put it into operation. It is devised to meet the needs of two classes of post-graduate students—namely, those requiring short general "refresher" courses, and those requiring advanced courses in the special departments of medicine and surgery. It is proposed to arrange the former courses on the group system, centred on a general non-undergraduate hospital, to be affiliated with special hospitals in its neighbourhood, and each group should be responsible for three or four such courses during the year. It is hoped that four, or perhaps five, of these groups will be founded in London. The programme will be begun by a course at the Prince of Wales's General Hospital, Tottenham, assisted by the special hospitals belonging to the North-Eastern group, from June 11th to June 23rd. Further details regarding this course, and others to follow throughout the year, will be published shortly. For graduates requiring more advanced instruction it is proposed that each of the special hospitals should undertake two or three courses during the year, and it is hoped that specialists from the undergraduate hospitals will be willing to come to the special hospitals on the invitation of the staff, and to assist in lectures and demonstrations.

THE PHYSIOLOGICAL EFFECTS OF EXPOSURE TO LOW TEMPERATURES.

IN a recent communication to the *Quarterly Journal of Experimental Physiology* (Vol. xiii., No. 1), S. W. Britton describes experiments on the effects of lowering the temperature in homoiothermic animals. The cooling apparatus employed is described and practically all the results were obtained on cats placed in a double-walled chamber, at a temperature of 5° to 8°. In the process of lowering the temperature of these animals there is a progressive paralysis of the central nervous system. In recovery a definite order of reappearance of reactions occurs at different deep rectal temperatures—e.g., knee-jerk and micturition reflexes, 16°; shivering reflex, 19·5°; clawing and winking reflexes, 21·5°; light reflex, 23°; equilibrium, sight, smell, and hearing, 27·5°; and coördinated action (walking, &c.), 28°. In the initiation and subsidence of stepping movements at low temperatures, a definite march or order is observed. A regular alternation between shivering and inspirations occurs between 22° and 24°. Exaggerated tonic spasms of the postural musculature occurs when the temperature of the recovering animal stands between 21° and 25°. In its progressive effects gradual cooling shows a strong similarity to the induction of anæsthesia, consciousness becoming abolished gradually and finally disappearing between 27° and 25°, while the ordinary reflexes are still maintained (24°–19°). At low temperatures (19° or 20°) the pupil becomes contracted, to dilate widely just before death. No condition resembling "artificial hibernation" can be said to occur when a homoiothermic animal such as the cat is reduced to very low body temperatures; a definite thermogenic ability is retained even at 19°, from which temperature spontaneous recovery is effected in 10 to 12 hours. The activities of the heart, respiratory muscles, and abdominal viscera are probably wholly responsible for an initial small rise in body temperature, but spontaneous shivering and stepping movements and an exaggerated muscular tonicity occurring about 20° are the chief factors in heat production and hence in recovery of the animal. So far as the author could determine, death from exposure to cold is due to paralysis of the respiratory centre in the medulla oblongata.

[1] Government Printing Office, Washington. 10 cents.

THE NEED FOR MORE AMBULANCES.

THE circumstances at a recent inquest held by the coroner for Westminster have led to a wide discussion in the press as to the need for more ambulances in the metropolis, but many of the suggestions made have shown unfamiliarity with the present position. The three authorities in London who direct ambulance services are the London County Council, the Metropolitan Asylums Board, and the St. John Ambulance Association, each authority catering for a separate and distinct type of case. The London Ambulance Service, directed by the London County Council, conveys, at any hour of the day or night, persons suffering from accident or sudden illness from the streets or public places, such as railway stations, theatres, factories, and workshops, to hospitals, infirmaries, or their homes. Although cases of accident occurring in private houses are accepted, the service is not intended for the removal from private premises of persons suffering from illness; when, however, in such a case the caller states that the life of the patient would be endangered failing immediate removal to a hospital, the call is at once accepted. The Metropolitan Asylums Board service deals with all cases of infectious illness, while the St. John Ambulance Association deals in consultation with the police with first-aid cases arising out of processions and public ceremonies. Both these services also convey cases of non-infectious illness where there is no urgency. The County Council ambulance service is served from seven stations, and the establishment of three additional stations has recently been authorised; it is hoped that when the latter are in use the time taken to reach cases (average during 1922, 8·7 minutes) will be considerably reduced. At each station a motor ambulance, equipped with first aid appliances and with a crew of two trained attendants and a driver, is constantly in commission, while during the busy hours of the day two stations have an additional ambulance. Although the majority of telephone calls are given by the police, a private individual can summon an ambulance. The telephone exchange is asked for "Ambulance," and no number is required; the place of the accident or illness should be stated, together with the caller's name. No charge is made for the call or for use of the ambulance. Since the inception of the service the number of calls has steadily increased from 2405 in 1915 to 23,966 in 1922; the average daily number of calls is now about 70. The chief officer of the London Fire Brigade is the officer-in-charge of the Ambulance Service, which is directed from the headquarters of the Brigade in Southwark Bridge-road, S.E. 1. The operative staff numbers 97. The estimated cost of the service for the year ended March 31st, 1923, was £34,470.

The case we have quoted may be added to other recent incidents which call attention to the insufficient

number of ambulances available for cases of sudden need in the vast area of London. Until more ambulances are available it is clear that there must be regulations for restricting their use. There would certainly have been justifiable complaint, for example, had a person run over by accident in Trafalgar-square been kept lying in the road for a quarter of an hour or more, because a policeman had authorised the use of an ambulance to convey from his hotel to a hospital a well-to-do citizen who was afterwards found to have little the matter with him. For a medical man to vouch for the urgency of a particular case is, of course, a different matter; and it must be remembered that in the case referred to above when the ambulance was summoned it came at once. Moreover, if the public demand the provision of more ambulances the public must be prepared to pay for them, recognising, on the one hand, that they are costly to purchase and will not be continually in use, and, on the other hand, that a better service will ensure more rapid attention and save more lives.

HENRY ARNOLD BECKETT.

NEARLY 30 years ago there died, while at his work, in the office of THE LANCET, Mr. Henry Arnold Beckett, who had been connected with the paper, first in the printing, and later in the editorial departments, from boyhood. The announcement which has recently been made that THE LANCET would celebrate its centenary in the autumn of this year, has brought us a letter telling us that the elder sister of the late Henry Beckett is still alive and that her hundredth birthday follows by only a few weeks the hundredth birthday of THE LANCET, she being some two years older than her late brother. Beckett's association with THE LANCET was an extremely intimate one. He was brought over from the printing department by the original Thomas Wakley, who had been attracted by his extraordinary gift of memory. He was made a sort of universal proof-reader for the Editor, and in the course of his duties became an absolute dictionary of information on professional subjects. He knew the names, addresses, qualifications, and professional and literary records of hundreds of medical men. He supervised the indexing of THE LANCET for years, and his recollection of the contents of back numbers was extraordinary. He had no medical training, but a wide, if theoretical, knowledge of medical science had been obtained in two ways. First, his large and variegated reading was so carefully performed, and with such attention to the author's meaning, that much of the essential teaching was made his own, and was ready for addition and modification. Secondly, the interviews which he had had with medical authors concerning the contents of their papers were always turned by Beckett into opportunities for increasing or revising his knowledge. On the occasion of his death many letters reached us from contributors to our columns acknowledging indebtedness to Beckett for important literary assistance.

THE ABORTIVE TREATMENT OF SYPHILIS.

IN a paper read at a meeting of the Nordisk Dermatologisk Forening in Stockholm and published in *Hospitalstidende* for Feb. 21st, Dr. H. Boas has given an account of his experiences of the abortive treatment of syphilis. Such abortive treatment he defines as the radical cure, by one or more courses of treatment, of syphilis in its first stage. The first question to be asked in this matter is: When can it be said with certainty that abortive treatment has effected a radical cure? The answer is tantalising: The only reliable evidence of a radical cure is, in the experience of Dr. Boas, reinfection. Without this retrospective evidence of a complete cure, the patient cannot be assured of recovery, however early and thoroughly he may have been treated. All may seem to be well after such early treatment, but years later—even as many as seven years later—a relapse may occur. All the patients included in Dr. Boas's statistics were observed for two years or more after the completion of treatment. The first series consisted of 245 patients, each of whom was given one intramuscular injection of 60 cg. of salvarsan, one intravenous injection of 40 cg. of salvarsan, and 50 inunctions of mercury. Of these 245 patients, 153 were Wassermann-negative and 92 were Wassermann-positive before the institution of treatment. Among the Wassermann-negative cases there were 12 relapses, and among the Wassermann-positive cases there were 10 relapses from six months to between seven and eight years after treatment. In a second series of cases there were 75 patients, each of whom received one intramuscular injection of 60 cg. of salvarsan, one intravenous injection of 40 cg. of salvarsan, 50 inunctions of mercury followed by intermittent mercurial treatment for three years. There were 47 Wassermann-negative and 28 Wassermann-positive cases in this series and, curiously enough, the four patients who relapsed all belonged to the group that was Wassermann-negative before specific treatment was instituted. In a third series of only 22 cases, each patient was given four injections of silver salvarsan (15, 20, 25, and 25 cg.), 50 inunctions of mercury, and intermittent mercurial treatment for three years. In this series no relapse had occurred within two to three years of treatment. Dr. Boas considers as quite unwarrantable the opinion of certain German authorities who have taught that when the patient is clinically and serologically symptom-free for two years after a course of abortive treatment, he may be considered as perfectly cured. He may be, but he cannot feel sure. It is not yet certain that supplementing the original course of abortive treatment with salvarsan and mercury by intermittent mercurial treatment for three years adds appreciably to the chances of eradicating the disease, but Dr. Boas is inclined to favour this three-year course, although the guarantee it affords is not absolute.

COMPOSITION AND STYLE.

HE who puts forth a treatise, however modest, on composition and style, and he, however informed, whose task it is to review such a work, are alike in the position of egg dancers—surrounded by traps which it is their duty to escape. Even such an expert as Sir Clifford Allbutt in the use and arrangement of words, so well-tried an exponent of the finest method of delivering a literary message, may break a yelk; but those who attempt to sit in judgment may make an omelette. However, in this admirable little book[1] we have found but one slip in the middle of most valuable counsel to medical writers. That the style of writing in many scientific papers is often bad is the sad truth. To express ideas and experiences in a lucid manner is by no means an easy task, and many a scientific paper whose matter is excellent loses value because the writer has not learned to convey his knowledge to others. "Have something to say, and say it as clearly as you can. That is the only secret of style," was the dictum of Matthew Arnold to G. W. E. Russell, but *belles lettres* only were in question. Writers of scientific papers must all be credited with something to say, not for its beauty or æsthetic qualities but for its utility. Therefore the actual matter is not adaptable or flexible. All the more necessary is it that the something should be said clearly, and a study of Sir Clifford Allbutt's book will be of the first assistance to the acquisition of the desired clearness. He tells authors what to avoid and at what to aim, and in one instance at least has himself fallen into the pit. Under the heading "Precision," he writes as follows: "The seat among the immortals of letters prepared for Tennyson may, for its ungainliness and its antics, be denied to the more vivid and penetrating muse of Browning." It

[1] Notes on the Composition of Scientific Papers. By the Right Hon Sir T. Clifford Allbutt, K.C.B. London: Macmillan and Co. 1923. Pp. 187. 6s.

is not difficult to see Sir Clifford Allbutt's meaning, but in strict grammar he has made that stationary thing, a seat, rise and gambol. We point to this sentence as an example of how fatally easy it is, even in a treatise on composition, to fall into error. Is there not the classic example of the schoolmaster who wrote on the black-board, during a lesson on composition, "Never use a preposition to end a sentence with."

This is the third edition of a work which has proved valuable and suggestive to many. The sections on the misuse of words and on the use of simple words, are particularly admirable and remind us how many of the great passages of English literature are made up almost entirely of words of one syllable. The Prayer Book version of the Psalms, which we trust will be spared to us, is full of such, and so is the Authorised Version of other Books of the Bible, to take one example from either: "I will lift up mine eyes unto the hills from whence cometh my help"; and again, "Come from the four winds, O breath, and breathe upon these slain, that they may live." It is by studying language such as that, and also by reading the works of the masters of scientific expression such as Newton, Huxley, Faraday, Tyndall, Watson, and Trousseau, among the dead, that a writer of scientific papers may learn to express himself so as to impart his knowledge to others. We decline the task of selecting living models; it would be as arrogant a proceeding as an attempt to indicate which of the leaders now with us hardly do their matter justice in the form in which it is presented.

ANTI-ANTIBODIES.

WHEN it was first realised that the introduction into an animal of a native proteid coming from any other species of live thing was often followed by the production of specific antibodies, people toyed a good deal with the idea that the reaction might lead to great complexities. If the host produces antibodies to the proteids of the parasite, it was not unnatural to assume that the parasite might elaborate antibodies to the proteids of the host and, among others, to the host's antibodies. To these anti-antibodies produced by the parasite, the host would presumably reply with anti-anti-antibodies, and so on indefinitely. There was, then, and is now, no reasonable doubt that antibodies are proteids or closely associated with proteids, but it seems that they cannot be identified as such by the fact that they excite the production of antibodies. Dr. S. P. Bedson, of the Lister Institute, has recently [1] examined a supposed instance of the occurrence of these anti-antibodies.

If a rabbit is repeatedly inoculated with the blood platelets of guinea-pigs its serum develops plate-lytic properties and causes purpura when injected into guinea-pigs. If a guinea-pig is given a quantity of this serum sufficient to cause symptoms but not large enough to kill it, and is then left for a fortnight or so, it is then found to be more resistant than normal guinea-pigs to the injection of the rabbit lytic serum. It has been supposed that this acquired immunity is due to the production by the guinea-pig of an antibody to the platelet antibody made by the rabbit. Dr. Bedson shows, however, that the phenomena can be reproduced if the first injection is the serum of a normal rabbit. The resistance to the second injection must therefore be supposed to be simply resistance to rabbit proteid, not rabbit antibody. Since antibody is associated with proteid, the former necessarily involves the latter. No evidence is obtained that the rabbit antibody is a new proteid substance. It might be and yet fail to arouse the formation of specific antibody. But it seems more probable that the antibody, which for convenience is spoken of as a special substance, is really only a special property of a normal serum proteid. Of the existence of antibodies as substances rather than properties there is, indeed, no evidence at all; if they are not separate substances they cannot lead to the production of separate and demonstrable antibodies.

If, then, the anti-anti-reaction fails as between two mammals—the group in which the capacity for antibody response is most highly developed—there is still less reason for supposing that anything of the kind occurs in the relations between a relatively elementary parasite and a mammalian host. For the antibody response to proteid from a different species is not a general property of living matter; it is very poorly represented in invertebrates generally, and its existence among bacteria and protozoa has never been demonstrated any more than in plants. It is now realised that bacteria protect themselves against mammalian antibodies by using their vast numerical abundance and capacity for rapid multiplication to breed out resistant races. They achieve immunity to antibodies, but it is effected by entirely different methods to those used by their sparse, slowly-breeding hosts, and it is racial rather than individual.

[1] Journal of Pathology and Bacteriology, vol. xxvi., p. 176.

FRENCH HOSPITALITY FOR FOREIGN COLLEAGUES.

MEMBERS of the medical profession travelling in France and wishing to study the French practice of medicine will find in the Association pour le Développement des Relations Médicales (l'A.D.R.M.) a useful guide and friend. It was established in 1920 and has grown in importance ever since. Its governing body consists of 40 members recruited from the most notable persons in the French medical profession, with Prof. Hartmann at its head. Its original aim was to help members of the medical profession, coming from allied and friendly countries, to Paris. A Bureau has been organised to supply visitors with information, and it has served this purpose so well that it has rapidly extended its activities, and has become an institution (1) for promoting the expansion of French medical science; (2) for establishing relations between French universities, societies, and journals with similar institutions abroad; (3) for encouraging the exchange of professors and other representatives; and (4) for paving the way for foreign doctors and students wishing to study in France. The Association has its headquarters in the Béclard Room of the Faculty of Medicine, and every morning and afternoon on week days visitors can obtain not only special information with regard to medical subjects, but also useful hints as to such practical matters as hotel charges and pension accommodation. All this information is given free of charge. A pamphlet, *l'Enseignement médical à Paris*, costing 1 franc, will give the medical visitor information as to: (1) the faculty of medicine and the hospitals; (2) medical teaching courses, including libraries and museums; (3) institutes and schools attached to the faculty; (4) clinical teaching in the hospitals; (5) complementary and post-graduate courses. The pamphlet contains a large plan of Paris with a key index of the hospitals. The telephone number of the Bureau is Fleurus 07–16.

SUDDEN DEATH FOLLOWING THORACENTESIS.

ACCORDING to Dr. Ernest S. Du Bray,[1] instructor of medicine in the University of California Medical School, San Francisco, cases of syncope, collapse, and death can be classified in three groups. In the first group of cases, as Capps has shown, the symptoms are neurogenic, being due to a pleural reflex. In such cases syncope during aspiration is caused by direct cardiac inhibition from irritation of the pleural or pulmonary nerves by the trocar or by congestion. It is commonest towards the end of the operation when the instrument is most likely to scratch the pleura and when the lung is most congested. Syncope occurring within 48 hours after aspiration is probably due to the circulatory

[1] American Journal of the Medical Sciences, March, 1923.

reflexes arising from congestion of the lungs. Syncope during irrigation of the pleural cavity is the result of a reflex arising from chemical irritation of the pleura. A second group of cases is always associated with demonstrable anatomical lesions of the lung parenchyma either in the form of laceration or punctured wounds caused by the trocar or definite pulmonary congestion of an extensive grade. This group includes cases of air embolism of the cerebral vessels and cases with well-marked signs of acute pulmonary œdema, which usually supervenes after drainage of the pleural cavity, though it may occur after simple exploration. The exact mechanism of this acute pulmonary œdema is still unsolved. Pulmonary thrombosis following lung puncture with resulting cardiac or cerebral embolism may also cause untoward symptoms. In this mixed group it is probable that several factors combined account for collapse in most instances. The third group of cases is that associated with the occurrence of accidental pneumothorax. Dr. Du Bray, however, is of opinion that many of the fatal cases ascribed to this cause would probably be better explained on the basis of the pleural reflex or pulmonary injury and congestion. In the case observed by himself, which occurred in a woman aged 23, the autopsy showed that collapse during exploratory puncture and subsequent death of the patient within 12 hours were not produced primarily by the pleural reflex or by the rapid production of accidental pneumothorax, but by a puncture wound in the middle of the right lung, which was surrounded by hæmorrhage and congestion associated with extensive pulmonary œdema.

THE REMUNERATION OF POOR-LAW MEDICAL OFFICERS.

THE recent circular issued by the Ministry of Health (Circular 382) on this subject contains information of importance to a large number of medical practitioners. By its instructions medical officers under this service in many instances will have their bonuses brought into salary, and their salaries are thus standardised or stabilised for the next few years. The Ministry do not desire a statement to be submitted to them respecting the changes in salary unless an increase of expenditure is required. Increases will not, as a rule, be considered more frequently than once a year or on a general consideration of the position—e.g., when it is proposed to revise salaries on a post-war basis instead of continuing to remunerate them by means of salary and bonus. In many instances—the number of these is unknown but is large—boards of guardians refused any bonus additions to the salaries of their medical officers during the war and after. In some instances it was alleged, in this connexion, that the operation of the National (Health) Insurance Act has in considerable measure transferred former medical work under the Poor-law to practitioners under the Insurance Act, and in other instances that war conditions, with their abundance of employment, had still further lessened the work of district medical officers. Whatever degree of importance attached to these contentions at the time they were made, conditions in this and last year have more than reversed the balance; and at the present time we have no doubt that older district medical officers would state that, although the general public health is good, their work is as great as say a quarter of a century ago. The amount of work necessitated for the unemployed, and still more for their dependents, has had a marked influence in increasing district Poor-law medical work. Furthermore the work of the district medical officer in certifying patients for admission to infirmaries has greatly increased, especially in towns, in part owing to the satisfactory fact that these infirmaries are gradually becoming recognised as general hospitals for the wage-earning classes, especially for cases not of a very acute type, which cannot be satisfactorily treated at home. We understand that at the present time an attempt is being made to collect and analyse information and thus help in securing the standardisation of salaries of district medical officers and of part-time resident medical officers of infirmaries in relation to the amount of work done.

The whole subject calls for exhaustive consideration as part of the larger question of consolidation of public medical services. Meanwhile we welcome the implied insistence in the circular of the Ministry of the condition that no medical officer's salary shall be reduced without their consent. We wish they had gone a step further and insisted on the regularisation of the situation of medical officers whose appointment is "temporary." This continues to be one of considerable hardship.

DEATH CERTIFICATION.

A BILL to amend the law relating to Coroners' Law and the Certification and Registration of Deaths and Burial was ordered by the House of Commons to be printed last February and may come up for reading to-day (Friday). It is largely based upon the representations of a committee of the British Medical Association, and it deals with many of the defaults and anomalies which all medical men know to exist to-day. Death certification is a matter of the first importance to the public and the medical profession, and many public officials have pressed for reform in the existing procedure. The Bill provides, inter alia, that, while the Registrar cannot proceed under Section 17 of the Births and Deaths Registration Act, 1874, until he has received a medical certificate of death, such certificate must be given by a registered medical practitioner who has viewed the body, being either the practitioner who certifies the cause of death, or the practitioner who has attended the deceased in his last illness, or, failing these, a special medical officer. The appointment of the special medical officer is to be made by the council of either county or borough "for the purpose (where the coroner shall so direct) of investigating and reporting to him upon the cause of death of the deceased." The fee to registered medical practitioners and special medical officers in respect of certification, for the certificate of death, will be 2*s.* 6*d.*, with an additional fee of 2*s.* per mile without the radius of a mile. The fee for the certificate of cause of death is also 2*s.* 6*d.* The fees to registered medical practitioners and special officers payable by the coroner are in a further schedule, and run as follows: For a report to the coroner that death has arisen from unnatural causes 10*s.* 6*d.*, and £1 1*s.* for any further report required by him; for making by the direction of the coroner a post-mortem examination, whether an inquest be held or no, £2 2*s.*, if without an analysis of the contents of any organ, while for such an analysis an additional fee not exceeding £5 5*s.* will be paid on the coroner's direction. For every day of attendance to give evidence on the summons of the coroner £1 1*s.* will be paid.

A section dealing with the report to be made to the coroner, where the circumstances are suspect or where the medical certificate is withheld, runs as follows:—

> "Where a medical practitioner has attended a deceased person in his last illness, or has attended at a birth of a still-born child, it shall be the duty of such practitioner within 24 hours after he has become aware of the death, or after the birth has occurred, to sign and deliver to the registrar in a sealed envelope a medical certificate of the death or still-birth (as the case may be), and (in a case of death) either to deliver as aforesaid a medical certificate of the cause of death, or if such cause be unknown to him, or if he shall be of opinion that the death is directly or indirectly arisen from, or been accelerated by violence, neglect, poison, or other unnatural cause, to report the circumstances of the death and his opinion thereon to the coroner for the district in which the death occurred."

A heavy penalty is placed upon error or default, for any practitioner who fails to comply with the provisions there set out will be liable for each offence to a penalty not exceeding £20.

THE WORK OF THE GENERAL NURSING COUNCIL.

THE General Nursing Council is settling down to its proper work. The Nurses Registration Act of 1919, which placed the nursing profession on a legal basis, granted it the privilege of electing its own governing body, and the first election of this Council, composed of 16 registered nurses, together with five representatives of the Ministry of Health, two representatives of the Board of Education, and two medical practitioners, took place last January. The nominated Council, which served from 1920 to 1922, had an uphill task in its endeavours to set up machinery designed to bring about standardisation and order amongst a large body of workers where practically no standards had hitherto prevailed. The most important work before the new Council must be of an educational nature, for until a sound foundation of education is laid the profession of nursing cannot be said to be securely established. The hospitals which supply the material for training are so varied in character that it is not easy to establish a uniform standard of education. The task, although formidable, is one which can be surmounted, and the General Nursing Council is inviting the hospitals which provide treatment of a specialised nature to submit schemes for the general training of nurses in which such special hospitals may be included. The Council has wisely omitted to state a minimum number of beds which shall entitle to receive recognition as a training school; evidence must be produced that work in that hospital can supply adequate material for training, and that the hospital is justified in entering its nurses for a prescribed State examination. It is now for every individual hospital to see that its nurses are adequately trained in the care of the sick and taken through a part or whole of the curriculum prescribed by the Council. The conduct of the qualifying examination and the establishment of a panel of examiners will demand much attention, since the standard of the trained nurse ultimately rests with the trained examiner. The General Nursing Council has brought out the first State register of nurses, but that is only a beginning. The standard laid down for the registration of existing nurses has been criticised as inelastic, but it should be remembered that a rule whereby nurses practising before 1900, and still in practice in 1919, are eligible to apply for registration, is now before the Minister of Health for his approval. Whether this extension is sufficient is doubtful, and a more generous interpretation of the Act may yet be necessary. Other questions now before the Council are the protection of the State registered nurses' uniform, the misuse of which in the future will be a penal offence, and the fixing of examination fees for future nurses.

SUMMER time starts in this country from next Sunday, April 22nd, at 2 A.M., and ends on Sunday, Sept. 16th.

AT a meeting of the London licensees of insulin with the Medical Research Council on Friday, April 6th, the suggestion was discussed that the Medical Research Council should issue an official announcement with regard to present supplies of insulin of British manufacture, intimating that arrangements have also been made for the distribution of temporary supplies of insulin of American origin. Messrs. Burroughs Wellcome and Co. deferred therefore the communication that supplies of their own manufacture have been issued. "Wellcome" Brand Insulin is manufactured throughout by Messrs. Burroughs Wellcome and Co., and we are informed that a batch of insulin produced at the Wellcome Physiological Research Laboratories some time before Dec. 1st, 1922 (for which date the Medical Research Council called the first informal conference with the manufacturers to discuss the production of insulin), proved satisfactory on test.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XVI.

THE TREATMENT OF PRIMARY OR SPASMODIC DYSMENORRHŒA.

THE effective treatment of dysmenorrhœa depends upon a correct recognition of the variety and of the conditions causing the excessive pain. It may be divided into two main classes—namely, pain with, and pain without any accompanying disease of the pelvic organs. The dysmenorrhœa most commonly met with in young girls or in sterile married women is the so-called primary or spasmodic variety without any disease of the pelvic organs.

The exact causation of the primary or so-called spasmodic dysmenorrhœa is uncertain, but the working hypothesis, which accords best with the facts, is that it is due to spasmodic rigidity of the sphincter muscle at the internal os accompanied by colicky uterine contractions.

General Treatment.

The first step to be taken in undertaking the treatment of a case of dysmenorrhœa is a careful investigation into the state of the patient's general health, her mode of life and surroundings. In the event of any general condition such as anæmia, chronic dyspepsia, or tuberculous disease being found, the treatment of these must first be undertaken. The two conditions most frequently calling for alleviation are anæmia and constipation, the first increasing the pain by diminishing the menstrual flow, a common clinical history being that the freer the flow the less the pain, and the second increasing the pain by producing pelvic congestion. In the same way such unhealthy conditions as overwork, standing for many hours, improper or insufficient food, the abuse of alcohol must all, if possible, be corrected. The lack of success that so often attends the treatment of hospital out-patients may be due to the failure on the part of the physician to recognise these factors or inability on the part of the patient to correct them.

Treatment may have to include, when possible, change of occupation, change of surroundings, more care at the periods, especially in the case of young girls at school.

Exercise and Baths.—The taking of a proper amount of exercise in the fresh air is important, and young girls often require advice as to the precautions they should take when the period is present. While for a healthy girl with no undue amount of pain it is unnecessary to alter her ordinary habits during the period, for those who suffer undue pain, rest is essential, and excessive exercise or the playing of games must be forbidden. The provision of a sufficient amount of sleep in properly ventilated rooms is important. All young girls should be advised to take hot baths during the whole of the period, and this habit should be acquired from the very commencement of their menstrual life. Care must be taken to avoid chills, and cold baths or bathing must, of course, be prohibited. The practice of taking hot baths certainly tends to lessen any pain that may be present, and is both cleanly and hygienic.

Constipation undoubtedly has a most baneful effect upon dysmenorrhœa, producing as it does pelvic congestion and marked pressure from scybalous masses on the uterus and ovaries, so that in every case it is essential to regulate the bowels, and not to be content to rely simply on the use of aperients or enemata. The patient should be ordered a proper diet containing an excess of vegetables, fruit, salt, and water. Many young women habitually drink too little; a sufficiency of fluid is essential if constipation is to be overcome. The patient should be told to try to have her bowels open at the same hour every day,

even if there is no desire to defæcate. Commonly, the first result of such an order is no action of the bowels for several days, yet no aperient should be allowed, and the patient should be assured that relief will ultimately and surely be obtained. It may be necessary to help matters by the administration of liquid paraffin as a lubricant. If this treatment fails to act, then one of the milder aperients, such as cascara sagrada, should be given in small doses every day, not in large doses occasionally. If it is obviously the lower bowel which is at fault, then this may be emptied regularly each day by small enemata, but the régime should be persisted in and the enemata given up as soon as possible. It is particularly when the dysmenorrhœa is associated with severe headaches and vomiting that the treatment of constipation is so important. If cascara sagrada disagrees, recourse may be had to one or other of the simple laxatives, to be taken with the paraffin, such as sulphur, senna, aloes, figs, or an effervescing saline mixture. Whenever possible, however, aperients should not be solely employed, and as adjuvants the importance of regular exercise and the use of abdominal massage should not be lost sight of.

Treatment of the Pain.

In any severe case of primary or spasmodic dysmenorrhœa the first and most important thing is for the patient to go to bed. If this is impossible it is much more difficult to obtain relief from the pain. Warmth should be applied to the lower abdomen and back by means of hot-water bottles. If possible, the patient should be put into a hot simple or mustard hip bath, or small enemata may be given as hot as can be borne and retained as long as possible. These may be simple enemata of hot water alone, or may contain such drugs as potassium or sodium bromide 20–30 gr., chloral hydrate 20 gr., chloretone 10–15 gr., especially when vomiting is a marked symptom, or antipyrine 15 gr., suspended in a small quantity, say 4 oz., of hot mucilage of starch.

In the treatment of the pain by the internal administration of drugs most reliance is to be placed upon the coal-tar derivatives, such as antipyrine, phenacetin or aspirin in doses of 10–15 gr. of each, or pyramidon 5–8 gr. Antifebrine has so often given rise to poisonous symptoms that it should not be employed. These drugs should be combined with small doses of caffeine citrate, in the strength of 1 gr. to every 5 gr. of the drug ordered, to lessen their depressant effects.

One of the most successful methods of treating these cases is by the administration of atropine. Atropine has a markedly sedative effect upon the movements of the stomach and intestine; after small quantities of aperients the normal peristaltic action is not affected, but the griping pains resulting from large doses or from the more violent purgatives are absent if atropine is given along with them. (Cushny.) The same sedative effect is seen in the case of the uterus, and here again the drug acts best when the muscular contractions are irregular and excessive. It is not surprising then to find that the administration of atropine produces good results in the treatment of primary or spasmodic dysmenorrhœa. The treatment should be commenced some few days before the expected onset of the period, and 1/100 gr. may be given in tablet form three times a day, and the dose may be increased if necessary, provided the patient tolerates the drug well. Benzyl benzoate has been suggested as a drug possessing a similar action to that of atropine and as less likely to produce toxic symptoms. It may be given in the form of an emulsion as follows: benzyl benzoate, 15 gr.; mucilage of acacia, 1 drachm; aromatic elixir, 1 oz., in a dose of one-half to 2 drachms every two hours as required. Many other drugs have been recommended and are still used in the treatment of dysmenorrhœa—for example, apiol, hydrastis canadensis, viburnum prunifolium, gelsemium, cimicifuga, pulsatilla, cannabis indica, and others. The three drugs which should never be ordered if they can possibly be avoided are alcohol, morphia, and cocaine. Alcohol undoubtedly has a considerable effect in relieving the pain, and it is an old-fashioned remedy, but the danger of establishing the practice of drinking is so grave that it should never be ordered, and the same warning applies to morphia. If it is necessary to give the latter drug—and at times the pain is so intense that it must be used—then it should be given as a hypodermic injection only. In cases where ordinary remedies fail and the pain is not so severe as to require morphia for its relief, it is permissible to give small doses of opium in such a prescription as the following: pot. brom., 15 gr.; sal volatile, half drachm; tinct. camphor co., half drachm; tinct. zingib., half drachm; aq. menth. pip., 1 oz.; two tablespoonfuls to be given when the pain is severe. In highly strung neurotic patients the combination of one or other of the bromides with some of the anti-spasmodics mentioned is often useful.

Dilatation of the Cervix.

When, in spite of all that can be done to correct any defect in the patient's general health and medicinal treatment of the pain fails, other measures must be resorted to. The procedure most commonly adopted is dilatation of the cervix. This is done with the object of paralysing, at any rate for the time being, the sphincter muscle of the internal os, and if it is to be successful must be performed thoroughly. When we remember the probable cause of the pain it is not surprising to find that the results of this operation are not very satisfactory. About one-third of the patients are cured, another third are relieved for a varying length of time over one or more periods, and in the remainder it fails. The operation may be repeated a second time if it fails the first time, but it is not as a rule worth while doing it more than twice.

When both medicinal treatment and dilatation have failed to relieve the pain it has been suggested that subtotal hysterectomy should be performed with the object of producing amenorrhœa. This procedure in a young woman is, however, never justifiable. In many of these patients the pain ultimately is relieved either by treatment, the lapse of time, or marriage and the occurrence of pregnancy. For these reasons so serious and mutilating an operation as hysterectomy should not be performed. At the present day the same result—namely, amenorrhœa, either permanent, or, better still, of a temporary character—can be obtained by the intra-uterine application of radium. The introduction of a 50 mgm. tube of radium into the interior of the uterus and its retention there for a period of 8–10 hours will result in amenorrhœa usually lasting for 12–18 months. The first result is often an excessive period, but after this the periods usually stop gradually or immediately, and the resulting period of amenorrhœa can be taken advantage of to improve the patient's general health if necessary in the hope that when the periods return they may possibly occur without severe pain. A sufficient number of these cases have not yet been treated by radium to enable us to determine the effect upon the pain when the periods return, but this method of treatment should be given a trial in any case in preference to performing hysterectomy.

Treatment of Membranous and Secondary Dysmenorrhœa.

If the passage of the shreds or membranes is not associated with pain no treatment need be undertaken. If severe pain is present then it should be treated in the manner already outlined. Treatment of the interior of the uterus by the application of drugs or the operation of curettage yields very poor results and is not as a rule worth undertaking. If the case is one of secondary or congestive dysmenorrhœa due to disease of one or other of the pelvic organs, then it is essential to undertake the correct treatment of the underlying condition whatever that may be, and only if this is impossible should the pain alone be treated.

G. BLACKER, M.D., F.R.C.P. Lond.,
F.R.C.S. Eng.,
Obstetric Physician, University College Hospital.

Special Articles.

REPORT ON THE HEALTH OF THE ROYAL AIR FORCE, 1921.*

THERE was a general reduction in sickness for the total force during 1921. This is more marked when it is taken into account that sickness figures for India are included for the first time. The rates for India are higher than those of any other area, but in spite of this, the ratio per 1000 of strength of fresh cases of sickness has dropped from 551·8 in 1920 to 497·3 in 1921. These ratios exclude cases of sickness of less than 48 hours' duration. The average duration of each case in days (excluding 48-hour cases) fell from 48·5 in 1920 to 19·6 in 1921. This drop is partly accounted for by the fact that the war legacy of low medical category cases, which was influencing the figures for 1920, had been eliminated during the year under review. The sole increase in ratios was in the death-rate, this being 4·7 per 1000 for 1921, compared with 4·4 for 1920. The total number of deaths was 134 as compared with 115 in the previous year. The disaster to H.M. Airship R.38 accounted for 24 of the 134 deaths. Excluding these 24 deaths, the death-rate per 1000 of strength for 1921 would have been 3·9.

Venereal Disease.

Successful efforts were made throughout the force during 1921 to reduce the amount of venereal disease. The total case-incidence per 1000 of strength was 36·1 compared to 49·6 in 1920. In the report under review a new feature is the distinction made between primary cases—i.e., cases reporting for treatment for the first time after infection—and all other venereal cases. The primary rate in 1921 was 22·4 per 1000, as compared with 36·9 for 1920. An interesting chart is given showing the primary case-rates per month; the chief feature of the chart is the steady diminution shown in the case-rate over the period of two years. The reduction in the rate would appear to have been very largely effected by the energetic prophylactic measures which were carried out. These measures are described in detail in the report. An attempt has been made to estimate the value of prophylactic disinfection and the results of this investigation are shown in tabular form.

"Upper Air-Passage Infections."

The term "upper air-passage infections" has been retained, and a chart is given showing the monthly case-incidence in ratios per 1000 of strength in the United Kingdom and abroad in 1921, and in the United Kingdom in 1920. The marked differences in the graphs of the United Kingdom for 1920 and 1921, in March, April, and May is probably largely due to the varying climatic conditions of the two years. It will be remembered that the weather in 1920 was remarkable for a wet spring, but 1921 was particularly fine during that season. A table is also given which shows the monthly case-incidence in ratios per 1000 of strength in each area abroad during 1921. From this table it appears that the Mediterranean littoral (which includes Egypt, Palestine, and Malta) shows the highest rate of all areas abroad, as did Egypt and Palestine in 1920, the respective ratios per 1000 of strength being 93·4 in 1920 and 110·4 in 1921.

Deaths and Injuries.

Deaths and injuries are treated as in the report for 1920. Tables are given showing death and injury ratios among different types of units. These are further explained in a table which shows the comparative case-rates of deaths and injury in each of the groups of units. Among the larger groups at home the main difference from the corresponding figures in the report for 1920 is the improvement in the health of personnel depôts—mainly due to the elimination of men of low medical category who were concentrated in such units in 1920. The headquarters group (consisting largely of administrative units) and personnel depôts have the smallest amount of sickness, whilst experimental units, flying schools, squadrons, and repair depôts again show the highest proportion of injury. Disease rates generally abroad are considerably in excess of those at home, which is naturally to be expected in view of climatic conditions, and it is suggested that the adverse climatic conditions abroad play some part in liability to injury, as injury rates abroad are 50 per cent. in excess of those at home.

A further table shows injuries classified by cause and nature of injury. This table also distinguishes between injuries regarded as occurring "on duty" and those "off duty." From the table it appears that in flying and propeller accidents the injuries are either general in nature or confined to the upper part of the body. In only 14 cases, out of the total of 149 due to these causes, was the lower extremity alone involved. On the other hand, the lower extremity alone was injured in 436 cases out of a total of 610 due to athletics; 431 out of these 610 cases were due to football, and of these 431 there were 109 cases of traumatic synovitis of the knee, or almost exactly one in every four cases. It is of interest that football accounted for 71 per cent. of all injuries due to athletics both in 1920 and 1921.

Fatal Flying Accidents, &c.

A new table is given which shows machine flights, machine hours, and fatal flying accidents. From this table it appears that although the fatal accident risk for each flight was lower at home than abroad, a larger number of hours was flown abroad for each fatal accident than at home. This is accounted for by the fact that the average duration of each flight overseas was longer than at home. From the material available, it is possible to say that for each of the officers killed during the year in flying accidents (other than R.38) over 4000 hours were flown.

Propeller accidents, accidents in starting motors, motor accidents other than those caused by starting motors, wounds in action, accidental gunshot wounds, other accidents on duty, accidents due to athletics, other accidents off duty, and accidents on leave, are dealt with in detail in the report. From consideration of the material available of accidents caused by starting motors, it appears that three types of cause may be distinguished: 1. By far the commonest, due to the direct impact of the starting handle on the hand at the moment of back-fire, nearly always resulting in Colles' fracture or sprained wrist. 2. Those due to the handle swinging round after the back-fire causing injury, usually of the arm above the wrist. The fracture of the radius or ulna, apart from Colles' fracture, were nearly all caused in this way. Depending on the size of the starting handle and its height from the ground, head and face and lower extremity injuries may more rarely result. 3. A more uncommon type of case occasionally occurs, owing to the starting handle throwing the operator against the radiator or the mud guards of the vehicle.

Sandfly Fever.

Very valuable research work on sandfly fever was carried out by R.A.F. bacteriologists at Malta during the year. This work resulted in the discovery of a spirochæte having morphological characters very similar to the *Leptospira icterohæmorrhagiæ* being isolated from cases of sandfly fever. The work is briefly described in the report and further research is still continuing. Apart from Malta, sandfly fever was prevalent in Iraq and India, and in a lesser degree in Egypt and Palestine. A chart is given showing the monthly case-incidence rates in Iraq

* To be purchased through any bookseller or directly from H.M. Stationery Office at the following addresses: Imperial House, Kingsway, London, W.C. 2, and 28, Abingdon-street, London, S.W. 1; 37, Peter-street, Manchester; 1, St. Andrew's-crescent, Cardiff; or 120, George-street, Edinburgh. 1923. 5s. net.

during 1920 and 1921. From the chart it appears that there was a marked reduction in the case-rate for sandfly fever. But it is impossible to say how much the lowered case-incidence was due to the prophylactic measures taken, as, judging from the experience of the past few years, it would appear that the severity of sandfly fever outbreaks in Iraq vary markedly from year to year.

Malaria and dysentery are dealt with in detail, as in the 1920 report, primary cases being distinguished from other cases.

The Central Medical Board.

The functions and work of the Central Medical Board form a separate chapter. From the table of accepted pilots, it appears that the physical standard of new officer personnel is fully up to the existing standards as determined by war-time conditions. Tables are also given which show the physical efficiency of serving officers. The tables bear out the impression previously held that flying, in addition to being associated with a high degree of physical fitness, is helped by youth and a certain degree of body bulk.

The principal points in relation to hygiene and sanitation form a separate section.

The Nosological Tables.

In the report for 1920 a detailed nosological table was included showing case, death, and invaliding rates for each overseas area, as well as for the United Kingdom and for the total force. In the report for 1921, the diseases have been grouped together under certain main headings, and in addition, all overseas areas have been grouped together in the main nosological table. A more detailed table is given for the more common diseases, and in this table each overseas area is dealt with separately. The effect of this method of presentation is that although the nosological tables cover the same number of pages as in the previous report, the matter on each page of the table is much reduced. This possibly accounts for the fact that the price of the publication is 5*s.* as compared with 6*s.* for the previous issue. This reduction, though slight, is satisfactory.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Proposed Antituberculosis Legislation.

As a result of the enormous increase of tuberculosis during and after the war, the Government has been induced to take more energetic measures against the disease. Among the provisions of a new Bill lately introduced into Parliament are the following: Every case of infectious tuberculosis of lungs or larynx must be notified to the district medical officer within a week of discovery and within 24 hours of death, either by the head of the family or by the medical attendant, or, in the case of hospital patients, by the hospital officials. Notification of change of a patient's residence is also required; where a dispensary station (Fürsorgestelle) exists the medical officer must pass the case to that institution for further care, and elsewhere the medical officer, after consultation with the practitioner in charge of the case, must take what steps are necessary—e.g., instruction of the patient and of the family as to danger of infection and as to prevention, especially in relation to the protection of children. Special arrangements will be made against the spread of the disease by teachers, waiters, and all persons engaged in the handling of food. Where no proper attendance is available, the patient may be transferred to a hospital or sanatorium. Private laboratories must notify to the district medical officer every case where tubercle bacilli are found in the sputum. On request of a practitioner or medical officer a local authority must undertake disinfection of a patient's rooms and property; when the expenses of disinfection would be greater than the value of the things the medical officer may order the latter to be burnt. Expenses of disinfection are to be recovered from public funds if the patient and his family cannot pay them. People omitting notification, or using patients' rooms before disinfection, are to be fined up to 150,000 marks. One difficulty in the way of administration of the Bill is the lack of an exact definition of "infectious" tuberculosis. If the presence of tubercle bacilli is taken as an index, protection for the patient comes rather late. It must, however, be borne in mind that the Bill leaves the treatment of tuberculous patients to the municipalities, the sick-clubs, and the workmen's insurance organisations, being itself aimed only at prevention of the spread of the disease.

Temperance Movement in Germany.

One of the most striking results of the war was the almost complete disappearance of drunkenness in Germany. During the war alcoholic liquor was not produced except for the fighting forces at the front; the German national beverage, beer, was produced in a form ("Schwachbier") containing only 2 per cent. of alcohol, which was very little appreciated, and was consumed in moderate quantities only. Thus, mental diseases caused by the abuse of intoxicants totally disappeared; many lunatic asylums were practically emptied, and a new asylum in Berlin, which was to be available in the autumn of 1914, was occupied for other purposes. It was hoped that after the war the Government would seize the opportunity permanently to reduce the consumption of spirits, and that, should they be unwilling to make Germany totally "dry," they might at least stop the granting of new licences for the sale of liquors. These hopes were unfortunately unfounded; the production of alcohol is a Government monopoly, and shortly after the end of hostilities the sale of liquors began again, on a larger scale than before. The consequences of this abuse are now obvious even to a superficial observer. Intoxication has become common amongst youths; asylums have again become overcrowded, and the financial distress of many working-class families is aggravated by the drink habit. The Association of Medical Abstainers, under the chairmanship of Prof. Abderhalden, the well-known physiologist of the University of Halle, are canvassing the medical profession to sign a petition against the abuse of alcohol. They propose that the sale of spirits should be forbidden to people under 18 years of age, that all bars and restaurants where alcoholic liquors are sold should be closed at 11 P.M., and that the granting and maintenance of licences should depend in any particular city or district on the result of a local referendum. In certain cities private votes have been taken with remarkable results; for instance, in the central district of Bielefeld, a large industrial town in Westphalia, a privately-arranged referendum resulted in 12,000 persons, out of 14,000 on the list, voting that the city should go entirely "dry."

Foreign Patients in Germany.

The influx of foreigners who have come to this country to take advantage of the depreciation of the currency has roused the Government to reduce as much as possible the granting of visas by German consulates abroad. Many Germans cannot find proper housing accommodation, whilst foreigners frequently have very little trouble in procuring well-equipped homes. The thousands of families expelled by the French from the Rhine and Ruhr districts must, of course, be provided with homes; the supply of milk and other food has again become almost as scarce as during the war—an evil aggravated by the number of foreign residents. The measures adopted by the Government, together with the temporary improvement of the exchange, has already reduced the number of foreigners. The medical profession in Germany is interested in this state of affairs, for visas are refused to foreigners who wish to consult German specialists. Prof. Kraus, president of the

Berlin Medical Society, has collected a number of cases where such refusal has resulted in disadvantage to German medical men, sanatoriums, and spas. Even when permission is granted to a foreigner to enter Germany, a time limit is set, and prolongation of the visit is made dependent not on the opinion of the medical attendant, but on a certificate from a district medical officer who cannot, of course, judge a case on its merits. Prof. Kraus has extracted from the Foreign Office a promise that the granting of visas to foreigners coming to Germany for health reasons shall in future be facilitated.

Mercury Poisoning.

A unique case of poisoning was recently shown by Prof. Umber at a meeting of the Berlin Medical Society. A hospital nurse had tried to commit suicide by an intravenous injection of 2 g. of metallic mercury. The first three days no symptoms of poisoning occurred, but after that period heavy diarrhœa, tenesmus, stomatitis, and oppression ensued. At the site of injection an abscess had formed, which on incision discharged metallic mercury and pus. The general symptoms gradually disappeared, but eight weeks later the abscess was again incised, and the symptoms reappeared, once more to disappear completely without leaving any trace. Apart from trifling vasomotor troubles and slight emphysema, nothing abnormal was observed for about half a year after the poisoning. The most remarkable feature of the case was the radiogram shown to the society. Both lungs, especially the right middle and inferior lobes, showed enormous masses of mercury emboli which on the plate appeared as intensely black spots corresponding with the net of the pulmonary arteries; a great lake of mercury was visible within the right ventricle of the heart. Prof. Umber concluded from this case that the collateral circulation of the lungs must be excellent, because the general circulation did not suffer from obstruction of the pulmonary arteries by the emboli; further, he concluded that metallic mercury must be comparatively harmless in relation to the human organism, whereas the application of mercury in the form of ointment or oil leads frequently to grave and sometimes fatal consequences.

April 12th.

Public Health Services.

ALLEGED DISSATISFACTION OF INSURED PERSONS: EXPERIENCE OF KENT INSURANCE COMMITTEE.

IN view of the statements made in the daily press as to the alleged general dissatisfaction of insured persons with the treatment they receive from panel doctors, the following facts extracted from the records of the Kent Insurance Committee have been brought to our notice by Dr. J. J. Day, chairman of the Kent Local Medical and Panel Committees.

From January, 1913, to Jan. 1st, 1923, 149 complaints were received and investigated by the committee. Dr. Day investigated completely the complaints received from January, 1919, to January, 1923. These number 71 in all. Of these, six were brought by doctors against insured persons. One was found to be substantiated; two were found not substantiated; three were dismissed as frivolous. The remaining 65 complaints were made against doctors. Fourteen of these dealt with cases of irregular issue of certificates and were not concerned with questions of treatment in any way; 11 were found to be substantiated; two were found not substantiated; one was not proceeded with. Eleven were cases of charging insured persons for treatment to which they were entitled: seven of these were found to be substantiated; four were found not substantiated. Forty cases involved charges of alleged unsatisfactory treatment: 16 were found to be substantiated; 17 were found not substantiated (in one case the doctor was censured); two were dismissed as frivolous; two were withdrawn; two were not proceeded with; one was found "not proven." Taking the last two groups together (although in the first 11 cases the question of treatment hardly entered), out of 51 complaints, 47 came up for investigation and 23 of these were found to be proved against the doctors involved.

In 1922 there were 13 complaints against doctors, five of which were substantiated and eight unsubstantiated. The total number of persons on the lists of the doctors involved was 18,920—5438 in the substantiated and 13,482 in the unsubstantiated cases. The total number on doctors' lists in Kent for the year was 300,098. This shows an average of one complaint among each 23,084 insured persons. The average over the four years 1919–22 was one complaint among each 23,753 insured persons. During each year there was an average of over 400 doctors on the panel.

In 1919 611 insured persons changed their doctor, while 244,680 were content to remain under their original doctor. In 1920 the numbers were 743 who changed and 271,820 who did not. In 1921 850 changed and 297,591 did not. In 1922 1433 changed, while 298,665 did not.

During the four years 1919–22, 375 doctors applied to have patients removed from their lists.

Dr. Day submits these facts without comment or argument, leaving his readers to judge for themselves the state of affairs in Kent.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Lowestoft.

THE Town Council of Lowestoft have decided to employ a full-time medical officer of health and school medical officer for the borough and port sanitary district, at a salary of £700 per annum. The acting medical officer of health, Dr. W. Hotson Palmer, has just issued his annual report for 1922. The total number of births in the year was 980, and of deaths 560. The birth-rate of 22·0 shows a decrease as compared with 25·6 for the previous year. The gross death-rate was 12·6, and the infantile mortality 72 per 1000, both slightly higher than in 1921. There was an epidemic of scarlet fever of a mild type during the year, and many cases of the disease probably went unrecognised, and so spread the infection. The total number of cases of diphtheria notified was 72; there were 11 deaths. In all the fatal cases occurring in the sanatorium diphtheria had been present five days or more before admission, and Dr. Palmer considers that most or all of these lives would have been saved had attention been called to the disease earlier. Chicken-pox was made notifiable on Dec. 22nd, 1922, and 32 cases were notified before the end of the year. There were 46 deaths due to bronchitis, 43 to cancer, 43 to organic heart disease, 31 to pneumonia, 14 violent deaths, and 5 suicides. An extensive sewerage scheme embracing the rural and Oulton Broad areas of the borough has been inaugurated, is now practically complete, and should be in working order in about six months. When completed this will enable the sanitary authority to deal effectively with the objectionable privy-middens and cesspools at present existing in those previously undrained areas. One hundred and thirty-four new houses were erected, or were in course of erection, during the year.

NORFOLK AND NORWICH EYE INFIRMARY.—At the annual meeting of the governors recently held the committee stated that satisfactory progress had continued during 1922; the in-patients numbered 244, and the out-patients 1631, with a total attendance of 5613. The income for the year from all sources was £2567, and the expenditure £1995, leaving a balance in hand of £572. The almoner reported that the system of making a small charge to patients had continued to work satisfactorily. The amount paid by in-patients was £122, and by out-patients £133. Last year was a notable one in the history of this institution. The infirmary was founded on July 11th, 1822, and on July 11th, 1922, its centenary was celebrated. The question of amalgamation of the Eye Infirmary with the Norfolk and Norwich Hospital has been finally decided on, subject to the separate identity of the Eye Infirmary being retained, and a subcommittee representative of both institutions has been appointed to prepare a working scheme, to be submitted to the governors of both hospitals for their approval.

Correspondence.

"Audi alteram partem."

INSURANCE PRACTICE.

A LETTER FROM A COUNTRY PRACTITIONER.

To the Editor of THE LANCET.

SIR,—I have been trying to think out the advantages of panel over the old club practice and can only find one. It is a very obvious one—increased remuneration. On the old club system we only got 4*s.* per member per year. This, of course, did not anything like pay a doctor for his work; but the fault originated among ourselves. When there was a vacancy for a club medical officer it was always keenly competed for. I think this was at first due to the fact that the doctor considered that by taking the members at a nominal figure he would assuredly get the majority of the wives and families. Later, at the request of the Guardians, during the hard years when the labourers earned at the most 12*s.* a week, and in order to lessen the parish work, the doctors formed what are still known as "surgery clubs" for the wives and children of club members. The money—1*s.* per quarter for adults and 6*d.* for children under 15—was collected every quarter from the village public-houses. This made the post of medical officer to a club much less valuable—in fact, destroyed its value altogether. Why medical men still competed for these posts it is difficult to say. Probably it was thought that to have 1000 surgery club members, although not paying in itself, would still bring grist to the mill.

I have said that the increased remuneration is the only point in favour of the panel system. But although to my mind there are many points against the new system, the advantage of increased remuneration overshadows them all. And yet in the old days a young fellow, straight from hospital without wife or family, in starting practice on his own or as an assistant, could enjoy the work and the experience, for it always does one good to do something for nothing. When I started 22 years ago I loved it. I used occasionally to attend the Lodge meetings, having gone through the ordinary ceremony of initiation, and I remember to this day the spirit of real fraternity prevailing there. Bro. So and So was in trouble or needed a truss or other appliance and extra remuneration was always allowed. The medical officer was looked up to with respect. He was asked to preside at their dinners and functions. When complaints arose, as they sometimes did, a deputation waited at the surgery to put the case and invariably went away satisfied. Of course all this is altered. We dealt with brothers then, we deal with material now.

When State insurance came in we studied the numerous rules and regulations and got a fair grip of them at the start. But the panel pigeon-hole soon became choked with new rules and amendments. One now found oneself under the letter of the law. It was easy to see that the regulations were framed for the town practitioner, that some of them were next to impossible in the country. Any doctor with a heart wants to infringe these rules. Example: A woman comes in; lives at village five miles away; asks for a certificate for a husband with influenza. Your journeys are all the other way to-day. Medicine and advice will do until to-morrow, but someone must come five miles for the certificate. Next case: Man comes in looking really ill, also living at a distance. "Doctor will you give me a certificate. I have not been to work for three days, but hoped I should throw it off in a day or two. Will you date it back to Monday for me." One has to reply, "No, go home and go to bed, but I cannot date certificates back." In the old days, when the doctor was a trusted person, it was left to his discretion. For patients who live within a mile from the chemist the bogy of expensive prescribing hangs over our heads although we supply what we can from our own dispensaries. Casualties come in and in the urgency of the moment we use up all our own dressings. If afterwards I prescribe 1 lb. of cotton-wool and three or four bandages to make up for the number missed I am taken to task for expensive prescribing.

We get word that the Government referee is coming down for an annual inspection. Shall we write and ask him to lunch? No bribery, play the game! Agreeably surprised to find he is flesh and blood. He examines the "record cards" which, by the way, are good as clinical records even if no good for statistics; but there are times when the country panel doctor is too tired to care whether he puts down his own good marks or not. Referee makes a great point of the fact that you have not filled in the left-hand bottom corner of the card where it runs "State whether married (M) single (S) or widowed (W)." This you understand is most important for statistics. He looks in your bottle shop and seems surprised: "My dear fellow, how much do you spend on drugs?—What! £250? Absurd! When I was in practice I did it on £40."

Anyhow, thank God I am a country practitioner! It is the most humane of occupations. One learns to sympathise with men in their sorrows, yea even in their sins, knowing that every man has a hard fight against many odds. One learns how to be happy and high-minded amid the meaner drudgeries of life. No voice of distress reaches our ears in vain. But the one phobia from which the country practitioner suffers is that of becoming out of date. I had the fear when I first started in practice. A few years back I spent my three weeks' holiday acting as senior house surgeon at my own hospital as a preventive, but still the phobia. How the Ministry of Health might help us here. They must have their statistics to feed the wolfish appetite of the public, but let us have in addition a body of real useful consultation referees. Let one come to our district every quarter and stay a week. We always have a dozen obscure cases which we cannot diagnose without reservation, or whom we want to help. It is the undiagnosed case that saps the life of the conscientious practitioner. Let the consultant's duty be that of affording post-graduate instruction in a friendly way to the doctor, and a senior country practitioner's life will again become worth living.

I am, Sir, yours faithfully,

April 13th, 1923. RUSTICUS.

*** We comment upon this suggestive letter in a leading article.—ED. L.

SERUM DOSAGE IN DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—Dr. C. B. Ker pointed out in your issue of March 31st that small doses of antitoxin are often efficacious and 8000 units—as recommended by the Ministry of Health—often unnecessary. The limited experience of a general practitioner may be of interest; he often sees the case early, the fever expert late. During 5½ years I have seen 126 cases of diphtheria, fortunately most of them early as the public are becoming educated to the horrors of the disease. It had been my practice to give 2000 units in early cases till the gratuitous distribution, since when I have given 4000. I always carry an antitoxin outfit on my car (the empty cartons make excellent bulb-carriers!), so that not more than five minutes need elapse between diagnosis and injection. Of 120 cases that recovered the only complications were tracheotomy in one case (seen late) and a slight nasal voice for a few days in another. When I return from a holiday, however, it is quite common to see three or four cases of palatal paralysis who have had a "sore-throat" during my absence, no antitoxin having been given. There are also cases seen for the first time with cardiac symptoms and a history of sore-throat a week or two previous.

I often wonder how many myocardial conditions are due to latent untreated diphtheria. I have had

six deaths—a terrible and largely avoidable mortality of nearly 5 per cent.; thus, of four of these, in two I was not sent for till the third day, in one the fifth day, and in one the sixth day! Three of them died of cardiac paralysis and one of œsophageal paralysis. Of the other two deaths—in one the initial diagnosis was ? scarlet fever, in the other septic throat, with consequent delay. These are but a small number of cases, yet they are typical and a larger number would show, I hope, improved results as the wisdom of the public and the doctor grows. Dr. F. Thomson speaks of the inability of the inexperienced man to distinguish a mild from a severe case. Is it not, rather, as Dr. Ker says, the promptitude with which antitoxin is given that matters? All the cases I see early seem mild enough, whereas all the fatal cases were either seen or treated late. One lesser point—what percentage of cases develop an antitoxin rash? I have seen only two, whereas the percentage is given in a well-read "Skin" book as 33.

I am, Sir, yours faithfully,

Aberdare, April 11th, 1923. AMBROSE W. OWEN.

BREAKDOWNS AND LOWERED IMMUNITY.

To the Editor of THE LANCET.

SIR,—The question must often suggest itself why one person in a hundred or a thousand dies suddenly of influenza, septicæmia, pneumonia, &c. Young and strong men and women die of influenza, and, as in a recent well-known case, an apparently healthy man in the prime of life, after some months of anxious work in a warm climate dies as the result of a mosquito bite. In such cases the risks of invasion by pathogenic organisms are not extraordinary. The individual may have been exposed to exactly the same risks many times before without ill-effect. Such facts seem to warrant the hypothesis that the normal resistance of the tissues may be suddenly lowered or altogether broken down without obvious signs of ill-health.

This letter is intended simply as a note of interrogation. Can our experts in immunity say how far it is now possible to detect and measure this loss of resistance to those fatal maladies? The new work on diphtheria raises one's hopes. Granted such knowledge it might be comparatively easy to go a step farther, and, by specific or non-specific means, restore the normal resistance of the tissues.

I am, Sir, yours faithfully,

London, April 12th, 1923. R. FORTESCUE FOX.

HOFFMANN'S BACILLUS AND ACUTE TONSILLITIS.

To the Editor of THE LANCET.

SIR,—In an annotation entitled Recent Work on the Schick Test, which appeared in THE LANCET of April 7th, dealing with the report by Dr. S. F. Dudley to the Medical Research Council, this author seems to have assumed that Hoffmann's bacillus is non-pathogenic. I feel that this assumption cannot pass unchallenged and for the following reason.

In 1918, while in a military hospital in England, two men were admitted to the wards suffering from acute tonsillitis. The appearance of the throat in each case was suggestive of diphtheria, but the exudate was not typical. Swabs were taken and subjected to careful bacteriological examination, with negative results for *B. diphtheriæ* but positive for *B. Hoffmann*. On the result of the bacteriological findings no serum was given, but local applications, and general medication prescribed. As no improvement was taking place swabs were again examined with the same result. The patients both became very toxic, and developed œdema, with scanty output of urine. The urine, which was clear on admission, was re-examined in both cases, and abundant albumin, blood, and casts were found. Swabs were examined a third time and still the same result. Both patients ultimately died from extreme toxæmia and practically anuria. In these cases treatment had been in the form of local applications and general medication throughout, and no serum of any kind had been administered.

Following on these cases four other patients were admitted with acute tonsillitis, and the early clinical condition was identical with the cases above recorded, and swabs were taken with the same bacteriological results—viz., positive for *B. Hoffmann*, and negative for *B. diphtheriæ*. I suggested to the medical officers in charge of the cases to try anti-diphtheritic serum, as previous treatment had been valueless, and 6000 units of serum were given subcutaneously in the lax tissues of the abdominal wall. The result justified the more or less speculative form of treatment, for almost immediate improvement took place in the clinical condition of the patients, and the throat cleared up in two to three days. Convalescence was slow but uneventful. None of these cases developed any marked toxæmia or kidney symptoms, as proved by systematic examination of the urine.

From this experience I have continued to consider *B. Hoffmann* as distinctly pathogenic, and in its local and general toxic effects to resemble very closely those produced by *B. diphtheriæ*. In practice I have encountered six cases of acute tonsillitis where the clinical aspect has suggested an infection by *B. diphtheriæ* and where *B. Hoffmann* has been found to be the infecting agent. In these cases I have given doses of anti-diphtheritic serum varying from 4000 to 8000 units, and the results obtained seem to justify this procedure, for the throats clear up rapidly without complications.—I am, Sir, yours faithfully,

DAVID SMITH, M.D., F.R.F.P. & S. Glasg.,
Physician to Out-patients, Royal Infirmary, Glasgow.
April 10th, 1923.

A CHLOROFORM TRAGEDY: THE QUESTION OF RESPONSIBILITY.

To the Editor of THE LANCET.

SIR,—According to the press reports of a recent inquest a patient about to undergo an operation lost her life owing to the anæsthetist using a chloroform inhaler the tubes of which had been wrongly connected. It would appear from the report that the woman doctor succeeded in shifting the responsibility for this on to the theatre sister, for the jury added a rider to their verdict that in future the theatre sister should be responsible for all apparatus and instruments in the operation theatre. This rider does not define the extent of responsibility, and, strictly speaking, the words would appear to mean "responsible for safe custody," but from the context it is clear that the jury meant to imply that the theatre sister should be responsible for the proper putting together and proper working of the apparatus. If this be so, it is not common sense, and, I venture to suggest, is not good law. As to the action of the doctor in shielding herself by blaming inferentially her subordinate, I express no opinion, but the rider of the jury should not be allowed to pass unchallenged. The theatre sister's duty is to keep the various instruments and apparatus clean and in proper order. During the operation she is under the direction of the surgeon, and so she can hardly be held responsible for the way in which the various instruments are used. Clearly, it is the anæsthetist's duty to see that the apparatus is in proper order before it is used. The position is somewhat analogous to that which arises when at an operation a swab is left in the abdominal cavity. The responsibility is the surgeon's. He may delegate the checking of the swabs to the sister, but the responsibility still remains his. "Qui facit per alium, facit per se." A surgeon, like any other mortal, may make mistakes, but any attempt to put the blame for errors of this kind on to the nurse is not only unfair but unjust, and should not receive either moral or legal sanction.

I am, Sir, yours faithfully,

HERBERT J. PATERSON.

London, W., April 14th, 1923.

THE LIFE-HISTORY OF THE TAPEWORM, *HYMENOLEPIS NANA*.

To the Editor of THE LANCET.

SIR,—The life-history of the dwarf tapeworm, *Hymenolepis nana*, has been, for many years, a subject of medical interest and discussion, the importance of which arises from the fact that it is regarded as one of the commonest tapeworms of man in certain parts of the world. The fact that a morphologically indistinguishable tapeworm is known to occur in rats adds complexity to the matter. For long, indeed, it was the custom to consider the two as in every respect identical, but certain experimental results have served to cast doubt on this assumption.

The problem, apparently simple in essence, presents unexpected difficulties, and to me there seems the necessity that more than usual care should be exercised in giving expression to any opinion dealing with it. On that account I venture to correct a slightly misleading statement occurring in a recent issue of the *Tropical Diseases Bulletin* (vol. xx., No. 2) to the effect that Nicoll and Minchin *claim* to have obtained cysticercoids of this species in fleas. As one of the writers to whom this "claim" is attributed, I may be allowed to state that no claim was intended and there is nothing in the published report (Proc. Zool. Soc., 1911) to suggest such. The intricacy of the subject was perfectly familiar to me at the time and, moreover, my friend, the late Prof. Minchin, was, I take it, too well acquainted with the pitfalls of experimental research to associate his name with the publication of an assertion the correctness of which had not been satisfactorily demonstrated.

I may note that, following the publication of our communication to the Zoological Society, further investigations were carried out but with no result sufficiently unequivocal to justify definite statement. The matter has since been taken up by other workers, but it is unnecessary here to enter comment on their results.

I am, Sir, yours faithfully,

London, S.W., April 12th, 1923. WM. NICOLL.

THE ADMINISTRATION OF ANTI-DIPHTHERITIC SERUM.

To the Editor of THE LANCET.

SIR,—The annotation in your issue of April 7th on practical points in the administration of anti-diphtheritic serum seems to me an unfortunate one, for while very properly calling attention to the want of appreciation on the part of the general practitioner of the importance of early injection of antitoxin, it also raises a sort of academic red herring by asking for records of experience of its intravenous administration. I have had considerable experience of intravenous injection, but I am not going to write of it in conjunction with the necessity for the early and adequate administration of antitoxin. The one is of small importance, whereas the other is a matter of life and death.

In May, 1921, I had occasion to write you drawing attention to the delay in the treatment of diphtheria, and which I then said was greatly attributable to awaiting the result of bacteriological examination. That fact, and to a lesser extent the delay of parents seeking medical advice, are the cause of an appalling number of deaths. I think there has been somewhat less waiting for the bacteriological examination of late, and some medical officers of health post notices in public places urging parents to have all sore-throats seen by medical men. I wonder how many medical officers of health do this?

Dr. B. A. Peters, in his letter in your issue of April 14th, tells us that the M.O.H. in his area circulates all practitioners from time to time advising the dosage which is based on the type of the disease prevalent at the time, and he adds that he thinks this a wiser plan than attempting to set up standards for the whole country. As far as I am aware, nothing in the past prevented this being done, but I wonder how many did it? It is possible, I suppose, that some medical officers of health are not very well versed in the dosage of diphtheria antitoxin, and I do not think very many would claim to be; indeed, I have been told by several medical practitioners that they were unable to procure from the M.O.H. more than 4000 units for a patient. Dr. Peters says the Ministry of Health advocates too low dosage to arrest the type of disease in his area. This is not so! The wording of the memorandum is:—

"Experience has shown that for the purposes of treatment it is seldom safe practice to rely on any dose which is less than 8000 units, whatever the age of the patient may be. The magnitude of the initial dose and the occasions on which subsequent doses are given must be determined by close observation of the case and it is impossible to lay down a stereotyped procedure. As an indication it may be stated, especially from the experience of Metropolitan Asylums Board hospitals, that when in a case seen early in the attack an initial dose of 8000 units (16,000 or more if the case is severe)....."

As I read this, the M.O.H. can advocate any dose to meet any variation in the type of the disease in his district so long as he does not advocate less than 8000 units, and I do not take it that Dr. Peters is objecting to this minimum dose.

What appears to me sad about Dr. Peters's letter, however, is his telling us that of the last 80 fatal cases in his hospital 19 received doses of from 2000 to 10,000 units within the first 48 hours while awaiting bacteriological confirmation before admission, but that these amounts were insufficient to prevent death. I imagine most of them would have recovered if all had received an initial dose of 8000 units or more, as advised by the Ministry of Health; and at all events either wrong advice as to dosage was given or the medical practitioners did not take it.

I am, Sir, yours faithfully,

FREDERIC THOMSON.

North-Eastern Hospital, South Tottenham, April 14th, 1923.

ALCOHOL AND INSANITY.

To the Editor of THE LANCET.

SIR,—If anyone chooses to assert, without other evidence than is provided by his own inner consciousness, that alcoholism (or tea-drinking, or smoking, or newspaper reading) is the chief cause of insanity, then, according to Dr. S. Wyard, the assertion is to be accepted until it is disproved, the burden of disproof resting on the sceptic. It is not enough to show that the elimination of an alleged chief cause has failed to bring about any decrease of insanity. That is, it seems, quite irrelevant unless it is also proved that none of the other innumerable antecedent conditions, to which causal influence may conceivably be imputed, have increased in proportion to the diminution of the supposed chief factor. If that is Dr. Wyard's argument, discussion can hardly be profitable.

I am, Sir, yours faithfully,

W. C. SULLIVAN.

Broadmoor, Crowthorne, Berks, April 15th, 1923.

WOMEN IN THE POST OFFICE MEDICAL DEPARTMENT.

To the Editor of THE LANCET.

SIR,—I shall be obliged if you will allow me briefly to reply to the letters on the above subject in your issue of March 17th.

Lady Barrett does not point out any misleading statement in my former letter. An expression of opinion is not a misleading statement, and I have given examples of men having to accept lower salaries in consequence of the employment of women in the above department.

I have nowhere suggested that any particular class of qualified women was not available; but that it was not necessary. In the P.O. medical service all the women and the men are under the chief and second M.O.'s. The women's branch and the assistant M.O.'s (men) branch are separate and distinct practices. Though a woman with 30 years' service may be receiving a larger salary than a man assistant in his early service she has nothing whatever to do with his work, administratively. On the other hand, in the absence of the chief or second M.O.'s the men assistants move up, and become acting chief and second M.O.'s; thus the women M.O.'s come under their supervision. A woman is never called upon to act as chief or second M.O. The first assistant M.O. (men) can count upon being acting C.M.O. for short periods during the year, and acting second M.O. for at least four months. The second assistant M.O. will act as second M.O. for shorter periods. For this work they receive no extra pay whatever beyond the slight difference on scale between the assistant M.O.'s male and female. If the Federation does not dispute the justice of demanding a higher standard of qualification and experience for the higher posts why deny the right of the men, who possess these essentials, to a slightly higher rate of pay than a woman who never performs these duties? How can it be maintained that the responsibilities of the men and women M.O.'s are equal and that they do exactly similar work? This is one instance only to the contrary.

In my last letter I dealt with the manifesto wherein was the statement that one woman—a candidate for an appointment in 1911—withdrew her application when she was informed by some unknown person that she would not receive the same rate of pay as the men received for similar work. By March 17th the one has budded into several. Apparently these women were satisfied with the particulars of the appointment supplied to them, and before anyone can discuss the matter we should be informed how the names and addresses of the applicants became available, and the nature of the communication they received. Possibly the information was inaccurate and they withdrew under misapprehension.

One word about these traditional loyalties of the medical profession and standing together sentiments. Remembering that the women have nothing whatever to do with the work of the men, and turning again to the manifesto, we find that in 1920 the female M.O. constituted herself a court of inquiry into the capabilities of the men. She called the late C.M.O. as a witness, then broadcasted with the aid of the Federation her comparison of the professional merits of the men and women. The men had no say in the matter. Is this a woman's way of showing traditional loyalty to her department and colleagues?

Medica states that the first woman appointed was placed third from the top, but neglects to say this was the bottom position on the day staff. She should read her letters more carefully if she wishes your readers to think I have stated that woman's work is valueless. The retirement—1 in 41 years—was taken from the manifesto, and I said nothing about past holders of office, and plainly referred to present conditions. There are no such titles as "senior" or "principal" female M.O.'s in the P.O., and the fact that during the past 40 years the female M.O. has performed one solitary journey into the country, when accompanied by one of her superior officers (men), proves my statement that whilst men assistant M.O.'s frequently do this kind of work, the women assistants never do it—another illustration of the fact that the women assistants do not perform "exactly similar work" to the men. The appointment in 1889 was under no different conditions to those preceding it.

That the P.O. is justified in expecting a higher qualification and experience from men than women is obvious. I am, Sir, yours faithfully,

April 9th, 1923. CLERICUS.

The Services.

ROYAL ARMY MEDICAL CORPS: EXAMINATION FOR COMMISSIONS.

AN examination for not less than 20 commissions in the R.A.M.C. will be held on August 1st. Applications to compete should be made to the Secretary, War Office, not later than July 20th. The presence of candidates will be required in London from July 30th. Prospective candidates can obtain a full statement of the duties and emoluments of the service on written application to the Secretary (A.M.D. 1), War Office, Whitehall, S.W. 1.

ROYAL NAVAL MEDICAL SERVICE.

R. W. Higgins to be Surg. Lieut.

ROYAL NAVAL VOLUNTEER RESERVE.

G. F. S. Parker (late temp. Surg. on probation) to be Surg. Sub-Lieut.

ROYAL ARMY MEDICAL CORPS.

Maj. R. C. Wilson to be Lt.-Col., vice Lt.-Col. and Bt. Col. J. S. Gallie, promoted.

Capts. G. A. E. Argo (who is granted the rank of Maj.) and S. S. Crosse retire, receiving a gratuity.

Capts. R. Fisher and H. H. Brown to be Majs.

Capt. W. J. Dowling relinquishes his commn. on account of ill-health contracted on active service and retains the rank of Capt.

Capt. M. S. Doubble relinquishes his commn. and is granted the rank of Maj.

General Hospitals: The undermentioned officers having attained the age limit are retired and retain their rank except where otherwise stated: Lt.-Cols. (Bt. Col.) W. J. Maurice, W. T. Brooks, W. Collier, and R. H. A. Whitelocke; Majs. Sir G. S. Abram, A. P. Dodds-Parker (granted the rank of Lt.-Col.), L. M. Guilding, E. Mallam, J. A. P. Price, W. A. P. Waters, J. C. R. Freeborn, W. J. Turrell, R. G. P. Lansdown (granted the rank of Lt.-Col.), and F. H. Edgeworth; Capts. N. B. Clowes, C. A. Coventon, W. Duigan, G. H. R. Holden, G. F. Murrell, W. B. Prowse, R. Ritson (granted the rank of Maj.), R. H. Sankey, A. L. Ormerod, J. F. Robinson, R. G. Lynam, F. Clarke, E. W. S. Rowland, T. B. Marshall, A. G. Kewley (granted the rank of Maj.), F. G. Gardner, J. Gardiner, E. Morton, and J. Henderson (granted the rank of Maj.).

Capts. W. A. Campbell (granted the rank of Maj.) and A. Mitchell (retaining the rank of Capt.) relinquish their commns.

MILITIA.

Capt. and Bt. Maj. L. W. O. Taylor to be Maj.

TERRITORIAL ARMY.

Supernumerary for Service with the O.T.C.: Capt. C. J. A. Woodside to be Lt. for service with the Medical Unit of the Belfast University Contingent, O.T.C., and relinquishes the rank of Capt.

TERRITORIAL ARMY RESERVE.

Capt. C. A. Pannett, from 3rd Lond. Gen. Hospital, to be Maj.

ROYAL AIR FORCE.

The following Flight-Lts. are transferred to the Reserve Class D.: O. St.L. Campion and M. J. Cahalane.

INDIAN MEDICAL SERVICE.

Lt.-Col. P. Dee to be Col.

Capts. C. A. Wood, J. A. Sinton, D. FitzG. Murphy, E. E. Doyle, and C. M. Plumptre to be Majs.

Nagendra Narain Majumdar to be Captain on relinquishment of his temp. commn.

Col. A. E. C. Keble, late R.A.M.C., has been appointed a Commander of the Military Division of the Order of the British Empire, and Capt. (Acting Maj.) G. A. F. Argo, R.A.M.C., Capt. (Temp. Maj.) J. M. MacKenzie, R.A.M.C., Capt. (Acting Maj.) M. P. Power, R.A.M.C., and Temp. Capt. J. S. Pinto, I.M.S., to be officers of the Military Division of the same Order for services rendered in the Field with the Waziristan Force.

Obituary.

ARTHUR CARLYLE LATHAM, M.A. OXF. AND CAMB., M.D. OXF., F.R.C.P. LOND.,

PHYSICIAN TO ST. GEORGE'S HOSPITAL, AND LATE DEAN OF THE MEDICAL SCHOOL.

WE regret to announce the death of Dr. Arthur Carlyle Latham, physician to St. George's Hospital, which occurred at a nursing home on Friday last, April 13th.

Arthur Latham, born 56 years ago at Cambridge, was the last surviving son of Peter Wallwork Latham, who was for 20 years Downing Professor of Medicine at Cambridge, and whose ninetieth birthday we recently commented upon in THE LANCET. He was educated at Fettes and Balliol College, Oxford, and obtained a first-class in natural science schools, winning also the Radcliffe Travelling Scholarship and being Research Scholar of the Grocers' Company. He completed his medical education at St. George's Hospital, where he was University scholar, afterwards periodically studying at Vienna, Heidelberg, and Berlin, and becoming the translator of Bing's "Pharmacology" and Limbeck's "Pathology of the Blood."

He was promptly elected assistant physician to the hospital and also to the Brompton Hospital for Diseases of the Chest. At St. George's Hospital he soon made his mark both as a teacher and clinician, while he was dean of the medical school at a trying time in the educational history of the hospital. In 1902 he won in open competition the first prize for an essay in connexion with the erection of a sanatorium in England for tuberculosis (King Edward VII. Sanatorium), and the publicity which attended the scheme and the award of prizes considerably enhanced his reputation as an authority on tuberculosis with the lay world, while it was already high among his colleagues. It was an unfortunate circumstance that he should, not long afterwards, have severed abruptly his association with the Brompton Hospital, but he had become connected with the Mount Vernon Hospital for Diseases of the Chest, and felt that in the general wards of St. George's, at his special hospital, and in his private practice he would never have any lack of clinical material. None the less Latham deprived himself of great chances of professional coöperation in matters in which he was deeply interested, and it was always felt by his friends that he had made a tactical error. Probably, however, his practice did not suffer thereby, for he undoubtedly became a general consultant of great repute, whose advice was specially sought in tuberculosis and pulmonary and cardiac disease.

Apart from his distinction as a clinician he earned a high reputation as an organiser, and when in 1907 practically all the metropolitan medical societies, save the Medical Society of London, were combined to constitute the Royal Society of Medicine, Latham, who had given endless time and trouble to assist Sir William Church and Sir John MacAlister in bringing about the movement, was elected one of the first honorary secretaries, Mr. H. S. Pendlebury being the other. This post he held for five years, and all those who worked with him can testify to his unsparing and self-sacrificing zeal, but outside his circle of collaborators little was known of the part that he played. And it may here be added that throughout his life Latham's object seemed to be to conceal his forethought for others, his high professional standards, and his eagerness to advance alike the cause of scientific medicine and the prospects of those who live by our calling. To hear him talk was to gather the impression that he was a cold and cynical man; to follow his actions was to find him revealed as the exact opposite.

From a colleague who was particularly associated with him in connexion with the treatment of tuberculosis we have received the following estimate of Latham as a physician: "Arthur Latham struck all who came into professional connexion with him as possessing to a highly developed degree the instincts of the physician. He owed remarkable success in diagnosis, alike to his close and learned observation of pathological phenomena and to his broad-minded attitude towards life, which enabled him to make due allowances for the patient's general constitution, methods of living, and psychical make-up. It was this range of observation which used to surprise his colleagues when its results appeared in the form of instinctive surmises. His help was largely sought from an early point in his career as a consulting physician, but he had not the temperament to make himself personally popular either with practitioners or with patients. He was brief, abrupt, and dogmatic; he laid down the appropriate course to be pursued in terms which were not always agreeable to others, and it is known that some of these resented their inability to produce upon him the impression which they considered was the right one. No desire to be agreeable to any patient would allow Latham to permit a latitude which he did not consider was in the interest of the subject. His insistence upon a strict interpretation of the advice which he tendered brought occasional antagonism to him from relatives of his patients, and the readiness in such circumstances with which he appeared to welcome a difference of opinion gave a wrong view. He appeared as an arrogant man, whereas he was thoughtful and generous in directions where he felt that these virtues should be exercised. He was very impatient with all who tried to deceive him, and too intellectually capable not to resent the attitude of those who deceived themselves."

Latham was not a prolific writer, and confessed to being without the necessary patience to bring what he wrote up to his ideals. But to the "System of Treatment," which he edited with Sir Crisp English, he contributed certain sections which illustrated both the range and exactness of his knowledge; he was the author of a convenient "Dictionary of Medical Treatment" intended for junior practitioners and students, with whose dilemmas he was always in sympathy; and his book "The Early Diagnosis and Modern Treatment of Pulmonary Consumption" reached a fourth edition. On the infrequent occasions of contribution to debates or medical journals, what he had to say was always worth saying, and his last paper in our columns, upon bronchial asthma, aroused much interest in the connexion between the disorder and protein sensitisation. He was an admirable public speaker, as all will recall who heard his various addresses on the proper relation of medicine to the public, delivered in connexion with the Federation of Medical and Allied Societies, in whose objects he was deeply interested.

British medicine and the British public have lost much in the person of Arthur Latham.

Dr. LEONARD WILLIAMS, in the following brief appreciation, bears witness to the qualities of his dead friend:—

"To appreciate Arthur Latham's great qualities it was necessary to have known him *dans son intimité;* and into that *intimité* very few were admitted. About 15 years ago circumstances pushed me suddenly beyond the rather forbidding portals, and since that time I had known him very intimately, in many ways more intimately probably than any one else. There has seldom been a man with a more impenetrable mask; seldom, indeed, one whose mask was more worth penetrating. To casual observers, and even to many who were the reverse of casual, he seemed to be the embodiment of clear-headed, far-seeing efficiency—that, and little else. In reality, beneath the polished steel of his orderly intellect, and of his incisive and cynical speech, there lay concealed an emotionalist, with one of the tenderest hearts that ever beat within a human breast. It was seemingly ordained that he should suffer, and suffer horribly, through that very tenderness. It was his lot to see his brothers die early and tragical deaths; the only

two men whom he really loved, Herbert Allingham and John Nachbar, were taken from him; the one dramatically, the other slowly and inevitably. His domestic life was a long-drawn-out pattern of unflinchingly courageous misery. He was greatly gifted. He had one of the acutest constructive brains that I have ever come in contact with, and his destructive criticism was as sound as it was usually merciless. The real distinction of his fine character and great attainments was written on his Napoleonic features; and so, latterly, was his acute and constant physical and mental suffering. The customary gravity of his face would occasionally be relieved by a smile of almost feminine sweetness and beauty, for he loved the lovable in life and had a keen and subtle sense of humour. He has succumbed to a long, painful, and exhausting illness, and, fond as I was of him, and much as I shall miss him, I cannot regret his release. He was a lonely man, who had outlived his ambitions and lost his illusions: may he rest in peace."

THE LATE DR. ALFRED GEORGE SIMMINS: AN APPEAL.

OUR readers may have noticed in THE LANCET of March 31st the coincidence of the death on March 23rd of Temp.-Surg. Lieut. Alfred George Simmins, R.N., and his wife. The double event was due to influenza, and the husband was only 32 years of age, the wife being just his senior. Dr. Simmins was educated at Guy's and Westminster Hospitals, qualified in 1914, and on the outbreak of war gave up a post in the Metropolitan Asylums Board to serve in the Navy. During his period of service he took the degrees of M.B., B.S. Lond. Demobilised in 1919 he acted for a time as medical registrar at Westminster Hospital before succeeding Dr. Croly in general practice at Hornsey. His excellent record was a guarantee of professional success, to which death has put so tragic a term.

We have received the following moving appeal on behalf of the children left orphaned in this pathetic manner: "They leave three little children, for only one of whom—a boy of 6—some provision has been made. No funds are available for the education of the other two, a girl and boy, aged 4 years and 15 months respectively, and they are left penniless orphans. At the time of the catastrophe Simmins was making good, but there was an overdraft at his bank as a result of the purchase of his practice, and he was precluded from the ordinary terms of life insurance by albuminuria, the relic of a previous attack of influenza. Even in these case-hardened days it would be difficult to find a parallel to such a combination of misfortunes, and we are proud to believe that our appeal will evoke a generous response from all branches of the profession. A committee is in process of formation, and several generous donations have already been received."

The appeal is signed by Sir William Hale-White, Sir James Purves-Stewart, Dr. G. F. Still, Dr. Henry C. Semon, and Dr. David Nabarro. Cheques and postal orders should be sent to the Treasurer, Simmins Appeal Fund, and addressed Royal Northern Hospital, Holloway-road, N. 7.

The following contributions have already been received:—

	£	s.	d.
Dr. G. F. Still	50	0	0
Mr. L. E. Barrington-Ward, F.R.C.S.; Mr. H. Tyrrell Gray, F.R.C.S.; Sir William Hale-White; Sir James Purves-Stewart; Dr. Henry C. Semon; Mr. G. E. Waugh, F.R.C.S. .. .. .. each	10	10	0
Mr. H. A. T. Fairbank, F.R.C.S.; Dr. F. John Poynton .. .. each	10	0	0
Dr. Joseph Birt; Dr. R. S. Frew; Sir Alfred D. Fripp; Dr. C. B. Heald; Mr. T. Twistington Higgins, F.R.C.S.; Sir W. Arbuthnot Lane; Dr. David Nabarro; Dr. Wilfred J. Pearson; Dr. Hugh R. Phillips; Dr. Harold Sington (first donation); Dr. Hugh Thursfield .. .. each	5	5	0
Mr. P. G. Doyne, F.R.C.S.; Dr. A. M. H. Gray; Dr. Bertram Shires .. .. each	5	0	0
Mr. A. T. Pitts, L.D.S., M.R.C.S.	3	3	0

INSULIN AND THE TREATMENT OF DIABETES.

ON Nov. 17th, 1922, and Feb. 21st, 1923,[1] the Medical Research Council published statements explaining the measures which have been taken in this country for studying the production and the properties of insulin, and for promoting its manufacture here upon a commercial scale. The following additional statement can now be made:—

Large-Scale Production.

British-made insulin is now being supplied from two sources—namely, the firm of the British Drug Houses, Ltd., in conjunction for this purpose with Messrs. Allen and Hanburys, and that of Messrs. Burroughs Wellcome and Co. These firms, who undertook the manufacture under agreement with the Medical Research Council, have satisfied all the requirements and tests of the Council for authenticity, standard value, therapeutic efficiency, and sterility of the product sold. It is hoped that these sources of supply will be augmented at an early date by three other firms in different parts of Great Britain who are under similar agreements with the Council. It should be understood that the rapid progress made by these five firms since the end of last November, and the actual achievement of successful and guaranteed supply within a period of little more than four months from the first attempts at large-scale production, have been made in spite of some serious handicaps. The large quantities of alcohol used for extraction brought the manufacture under almost prohibitive restrictions until certain concessions were made by the Commissioners of Customs and Excise, which allowed specially denatured alcohol to be used duty-free. The embargo upon importation of Canadian cattle had greatly reduced the supply of fresh raw pancreas material in this country and a good deal of improvisation and initiative have been necessary for the effective organisation of the available supply of raw material during recent months. The only limit now placed, and likely to be placed for some time, upon British production is the limitation of raw material available under suitable conditions.

In the meantime, Messrs. Eli Lilly and Co., of Indianapolis, Indiana, working under agreement with the University of Toronto, have been proceeding towards large-scale production since the early summer of 1922. By the courtesy of the University, this firm was able to submit samples of their insulin product to the Medical Research Council in February last for testing. At the end of March, Messrs. Eli Lilly found themselves in a position to offer the Medical Research Council a considerable supply of their product for distribution in this country under similar restrictions to those at present governing distribution during a provisional period in the United States and Canada—namely, to approved hospitals and to physicians with approved clinical facilities. In view of the urgency of the demand, the Council cabled for this supplementary American supply, of which the first consignment is expected to arrive during the present week. It is a remarkable coincidence that the products of large-scale American production should become available here only a few days after the first commercial supply of British insulin.

American and British Sources.

The Medical Research Council have arranged that the insulin of American manufacture should be distributed by those British firms whose own product is already available or may hereafter become available, and the amount distributed by each British firm will be in proportion to the volume of its own production. Both British and American insulin will be sold here only under that name (except for the addition of marks or brands indicating origin). A maximum selling price has been fixed by agreement with the Council for a short provisional period, and there is a

[1] THE LANCET, Nov. 18th, 1922, Feb. 24th, 1923.

probability of its being reduced at an early date. The British firms have adopted a method of purification of the final product worked out by Dr. Dudley at the National Institute for Medical Research. By this method it is possible to get rid of over 90 per cent. of the solid matter in the crude end-product of the original process, and it allows the manufacturers to offer the active principle in the form of hydrochloride in highly concentrated form, freed from accidental irritants and other substances. For the avoidance of improper exploitation of this valuable process, provisional application has been filed by Dr. H. W. Dudley, jointly with the Medical Research Council, for patent rights. It is probable that in the near future the American supplies will be submitted to the same process and offered in the same form.

All the supplies now available have passed suitable laboratory and clinical tests for purity, potency, and sterility. The physiological unitage originally indicated by the first producers of insulin in the University of Toronto has not been retained. By agreement with the University, the American manufacturing firm has made current in the United States a unit having the approximate value of one-third of the original Toronto unit. The Medical Research Council have decided to adopt this smaller unit, so that all the insulin now made available in this country, whether British or American, will be standardised to a common unit value. Every batch put upon sale, of whatever origin, will be biologically tested under the supervision of the Council, and every preparation sold must bear a number corresponding with that of the batch from which it has been drawn.

Distribution of the Available Supply.

For a provisional period the Council have retained, under their agreements with the manufacturers, control over the distribution of the commercial supplies analogous to that exercised by the University of Toronto over the products of American manufacture. It is clearly desirable, apart from other considerations, that now, and at least until the supply is more than equal to the demand, the available insulin shall be distributed so as to reach those patients whose need is greatest, and so as to be placed in the hands by which it can be administered to the greatest effect and with the least waste. Difficult problems arise here of interest and importance to the public, to the medical profession, and to hospital administrations.

The research work, both in the laboratory and in the wards, which has brought manufacture in this country to its present pitch, and all the connected problems of standardisation and further research work, fall properly within the sphere of the Medical Research Council. These medical administrative problems of distribution, on the other hand, have been submitted by the Council to the Minister of Health within whose responsibility they properly lie. Having regard to the special nature and urgency of the occasion, the Minister has appointed a small Committee to advise him upon the subject, composed as follows: Sir George Newman (chairman), Dr. R. A. Bolam, Sir Walter Fletcher, Sir Humphry Rolleston, Dr. Alfred Salter, M.P., Dr. G. F. McCleary (secretary) (address, Ministry of Health, Whitehall).

To avoid any unnecessary delay, provisional authority had been given to the firms to distribute insulin to various large hospitals, and the first British-made insulin was actually so supplied on April 12th. On the advice of this Committee, manufacturers will be directed, during the present period of restricted production, to supply insulin only to those hospitals and to those registered medical practitioners who have proper facilities at their command for making accurate blood-sugar determinations.

Restrictions Imposed.

Each hospital and practitioner so supplied will undertake to observe the following restrictions upon the use of insulin:—

1. Careful correlation will be made of the diet, of the blood-sugar changes, and of the insulin dosage in each case. For at least one group of cases it is known already that the insulin dosage can be reduced progressively with suitable adjustment of diet. This reduction allows economy of insulin, besides the advantage it may bring to the patient.

2. Insulin will not be given to those whose symptoms can be controlled by moderate restrictions of diet. There should be no luxury use of insulin till supplies are abundant.

3. It is understood, of course, that in emergency and apart from the careful correlation just mentioned, insulin will be given to those in diabetic coma or those nearly approaching it, and it may be given to those with diabetic symptoms needing special preparation for some surgical operation.

4. Care will be taken to avoid the danger of giving insulin to non-diabetic cases (e.g., to patients with renal glycosuria).

Hospitals or practitioners desiring supplies for immediate use should apply to one or other of the British firms named above.

It is hoped that at a very early date preliminary communication will be made of the results of the insulin treatment which has been in progress during the past months in the hospitals at London, Edinburgh, Glasgow, and Sheffield, named in the earlier statement by the Council, in order that experience gained in this clinical research work may be put at the disposal of the profession for their information and guidance.

Medical News.

CONJOINT EXAMINATIONS IN IRELAND BY THE ROYAL COLLEGE OF PHYSICIANS AND THE ROYAL COLLEGE OF SURGEONS.—The following candidates passed the spring examinations:—

Third Professional Examination.—Anna Allen, P. M. Banim, Moira E. Connolly, Bridget Crawford, T. A. Cronhelm, J. Dalrymple, Pauline M. Dooley, R. G. Freeman, V. D. Gordon, J. A. Hynes, Wilhelmina C. Maguire, M. A. Monahan, A. ffrench O'Carroll, W. O'Connor, and P. C. Raftery.

Final Professional Examination.—Thomas Aitken Austin, Alan Plewman Brown, Josephine Alcorn Carson, Maurice Cremin, Victoria Elizabeth Davidson, Evelyn Sylvia Delany, John Francis Devlin, Douglas Arthur T. Eaton, Isaac Jabob Eppel, Thomas Valentine Fitzpatrick, Sydney George Gilmore, Alphonsus Joseph Harte, Michael Joseph O'Riordan, Robert Dobbs Seale, and Vincent Francis Walsh.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At examinations recently held the following were successful:—

THIRD EXAMINATION.

Alastair F. B. Mackay, Eleanor P. Topping, William A. Kemp, Charles Campbell, John S. Caldwell, Radcliffe D. Jones, Joseph F. Sweeney, Carapiet Aviet Basil, David D. Radford, Alexander J. M. Findlater, Harold V. R. McKinlay, Constance P. H. Hunter, James D. Edminson, Frederick Blacklee, William Rogers, John C. Shiach, Mollie F. Churcher, Cecil J. R. Morrison, Adam S. Gordon, Albert E. Williamson, Moss M. Bronstein, Cavin J. Bell, Donald L. Crawford, Petrus Johannes Badenhorst, James K. Hunter, George R. Mitchell, and Alexander S. Ballantine.

Pathology.—Leslie V. Sherrin.

Materia Medica.—John B. Hutchison, John Lees, William McKim, William A. Evans, Margaret M. McCusker, Joseph Horsham, Joseph B. Stromier, Winifred G. Price, David D. H. Craig, John M. Coutts, Sarah Boyle, Robert H. McKinnon, John J. MacKenzie, Irma E. L. Mackenzie, David Lumsden, Lewis Mackenzie, Douglas B. Craig, John J. McKenna, and Charles E. Millen.

FINAL EXAMINATION.

The following candidates having passed the Final Examination, were admitted L.R.C.P.E., L.R.C.S.E., L.R.F.P. & S.G.:—

James M. McLintock, Minnie E. McMurray, John M. Cockburn, Behari Lal Chopra, Nicholas J. Laubscher, William N. Stirling, George Abeysinche Weera Wickramasuriya, Daniel Maximos, Dinbai Jehangeer Dubash, Edward R. C. Walker, Philip G. Bainbridge, William Paris, Jonathan Johan du Pre le Roux, James H. Murrell, Sarel Jacob Reich, Daivasikamany Kanaka Sabhesan, Ernest Levine, Louis Jaffit, John J. Mann, Don Valentine Walpola, and James S. Bizzett.

Medicine.—Hari Prasanna Sen, Wilhelmina C. Storrie, Ruby S. Beveridge, Eliazar Gelfer, Donald G. Coutts, Martha D. Devon, Maurice N. Gelb, George A. P. McConey, and Duncan R. Nicol.

Surgery.—Cyril A. Paulusz and Maurice N. Gelb.

Midwifery.—Thomas F. Kelly, Ruby S. Beveridge, Cyril A. Paulusz, William E. Haydon, Martha D. Devon, George A. P. McConey, and Thomas J. Muir.

Medical Jurisprudence.—John A. McCann, John S. Whiteside, Joseph McAuley, Anna G. Laubscher, Darwish Moustafa Safwat, Eliazar Gelfer, Harold V. R. McKinlay, Arthur W. H. Noble, James Ryan, Lauchlan McLean, and Mary C. Semple.

HUNTERIAN SOCIETY.—The annual general meeting will be held on April 23rd, at 8.15 P.M., in the Small Hall, the Royal Society of Medicine, 1, Wimpole-street, London, W. 1. Dr. Hingston Fox, who for some years has been engaged in compiling the centenary history of the society, will discourse on some of the more interesting topics and personalities connected with the society under the headings: Jonathan Hutchinson the Naturalist, Henry Gawen Sutton the Philosopher, and Hughlings Jackson the Seer. The address will be illustrated with the epidiascope.

THE ROYAL SOCIETY OF MEDICINE: *The Sir William Dalby Memorial Prize.*—Lady Dalby, widow of the late Sir William Dalby, has handed to the Royal Society of Medicine £500 for the purpose of providing a perpetual memorial of her distinguished husband. The trust deed provides that the interest on the capital sum is to be accumulated for five years when the product, less expenses, is to be awarded as a prize to the person who during the previous five years has produced the best original work, done or published, for the advancement of otology. The prize will be awarded by the Council of the Royal Society of Medicine upon the recommendation of the president and vice-presidents of the Section of Otology.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A quarterly Council was held on April 12th, Sir Anthony Bowlby presiding.—The Secretary reported the death on March 18th, at the age of 61, of Sir William Thorburn, and a vote of condolence was passed.—The President reported that the vacancy in the Council thus occasioned would be filled at the meeting of the Fellows on July 5th next, and that the vacancy on the Court of Examiners would be filled at the next meeting of the Council on May 10th.—A report was read from the Secretary respecting candidates found qualified for the Diploma of Member, and diplomas were granted to the following four candidates: Bernard Bourke (Dublin), Emmie Dorothy Fenwick (Royal Free and St. Mary's), Marjorie Annie Godfrey (Royal Free), Naja R. Mucadam (Bombay and Royal Free).—A report was read from the Secretary respecting candidates found qualified for the diploma of the Licence in Dental Surgery, and a diploma was awarded to Mr. D. E. Thomas (Pennsylvania and Middlesex).—It was reported that the Jacksonian Prize for the year 1922 had been awarded to Mr. Sidney Forsdike for an essay on the Effects Produced by Radium upon Living Tissues, with Special Reference to its Use in the Treatment of Malignant Diseases.—The Council decided that the subject for the Jacksonian Prize for 1923 would be the Pathology, Diagnosis and Treatment of Œsophageal Obstruction.—Mr. Douglas Gabell was elected a Member of the Board of Examiners in Dental Surgery.—Sir Arthur Keith was appointed Thomas Vicary lecturer for the ensuing year.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.—The annual congress will be held from April 26th to 28th at the Royal Society of Medicine, 1, Wimpole-street, London, W. 1, on Thursday, April 26th, Dr. A. Maitland Ramsay presiding. On the first morning the President will give his opening address. Papers will be read by Mr. E. Treacher Collins and by Sir William Lister on the Ætiology of Angeoid Streaks in the Fundus Oculi, and by Mr. R. Affleck Greeves and Mr. R. Foster Moore, on a Series of Consecutive Cases of Cataract Extraction by Barraquer's Method. Mr. D. V. Giri will offer Some Observations on Intracapsular Extraction of Cataract, with Description of a Simple Technique; and Mr. Charles Killick will discuss a Series of a Hundred Cases of Cataract Extraction Removed under a Subconjunctival Bridge. In the afternoon a discussion on the Disorders of the Blood and their Ophthalmological Manifestations will be opened by Sir Humphry Rolleston, Sir Frederick Andrewes, F.R.S., and Dr. W. C. Souter. Mr. R. Rutson James and Dr A. J. Ballantyne will speak, and the latter will communicate a paper entitled Some Illustrations of Retinal Vascular Disease, and of Fundus Lesions in Diseases of the Blood. At 5 P.M. the Bowman lecture will be delivered by Prof. George E. de Schweinitz, president of the American Medical Association, on Certain Ocular Aspects of Pituitary Body Disorders, mainly exclusive of the Usual Central and Peripheral Hemiopic Field Defects. At 7.30 P.M. members will dine together at the Langham Hotel, Portland-place, London, W. 1. On April 27th, in the morning, a discussion on the Diagnostic Significance of Proptosis will be opened by Mr. Wilfred Trotter, Mr. Herbert Fisher, and Dr. Angus MacGillivray. The following also intend to speak: Mr. Percy Flemming, Dr. T. H. G. Shore, and Mr. P. G. Doyne. Papers will be read by Mr. W. T. Holmes Spicer on Secondary Corneal Opacities, and by Mr. F. A. Williamson-Noble on Macular Changes in Thrombosis of the Central Retinal Vein. In the afternoon a clinical meeting will be held at the London Hospital. In the evening demonstrations will be given by Mr. Humphrey Neame, Mr. F. A. Ross and Dr. Shepheard-Walwyn, Mr. B. T. Lang, Mr. A. Beck Cluckie, Mr. Basil Graves, Mr. John Rowan, Mr. G. F. Alexander, Mr. Leslie Buchanan, and Mr. R. E. Wright. On April 28th papers will be contributed by Dr. Angus MacGillivray, Mr. Leslie Buchanan, Mr. Percival J. Hay, Mr. Humphrey Neame, Mr. W. B. Inglis Pollock, Mr. Lindsay Rea, and Mr. G. F. Alexander.

TUBERCULOSIS SOCIETY.—An ordinary meeting will be held on Monday, April 23rd, at 8 P.M., at the Margaret-street Hospital, Margaret-street, London, W. 1, when Dr. A. K. Chalmers, M.O.H. for Glasgow, will read a paper on Housing and Tuberculosis.

ROYAL INSTITUTION.—On Tuesday, April 24th, Sir Arthur Keith will deliver at 3 P.M. a third lecture on the Machinery of Human Evolution. On Saturday, April 28th, at 3 P.M., Dr. Leonard Williams will deliver the first of two lectures on the Physical and Physiological Foundations of Character. The Friday evening discourse on April 27th, by Mr. C. V. Boys, will be on Measurement of the Heating Value of Gas; and that on May 4th by Prof. Soddy will be on the Origins of the Conception of Isotopes.

MEDICAL HYDROLOGY: LECTURES AND CLINICAL TEACHING AT THE UNIVERSITY OF LONDON.—A special course of lectures and demonstrations has been arranged by the London University Extension Board and a committee of the International Society of Medical Hydrology, and will be held at the laboratories of the University of London at South Kensington, and at two of the British spas, from May 29th to June 4th. All medical men interested in the therapeutic use of waters and baths are invited to take part in this course, of which full particulars will shortly be issued.

CONFERENCE ON THE MILK QUESTION.—A conference will be held at the house of the Royal Society of Arts, John-street, Adelphi, London, W.C. 2, on April 25th, at 4.30 P.M. Short papers will be read as follows: (1) The Arguments for Maintaining an Open Market for Fresh Milk, by Dr. R. Stenhouse Williams; (2) Changes in the Digestibility and Nutritive Value of Milk Induced by Heating, by Prof. J. C. Drummond; (3) The Effect of Heat on Some Physiological Principles in Milk, by Dr. S. S. Zilva. A demonstration of some of the chemical changes in milk on heating to various temperatures will be given by Capt. John Golding, and Mrs. A. T. R. Mattick, M.Sc. Mr. F. D. Acland, M.P., will preside.

CONGRESS OF DERMATOLOGY AND SYPHILIS.—A congress on dermatology and syphilis will be held at Strasbourg from July 25th to 27th, preceded by a congress on cancer (July 23rd and 24th), and followed by one on leprosy (July 28th to 31st), in connexion with the Pasteur celebrations, under the auspices of la Société française de Dermatologie et de Syphiligraphie of the Comité d'organisation de l'Association des Dermatologistes et Syphiligraphes de Langue française. Clinical cases will be shown and discussions will be held on the following papers: Sensitisation and Desensitisation in Skin Affections, by Dr. Ravaut (Paris) and Prof. Spillman (Nancy); Nævo-carcinomata, by Prof. Masson (Strasbourg) and Prof. Bruno Bloch (Zurich); the Treatment of Syphilis in the Early Stage, by Dr. Queyrat (Paris) and Prof. Malvoz (Liège); and the value of various ways of introducing Medicaments in the Treatment of Syphilis, by Dr. Milian (Paris) and Dr. Bodin (Rennes). Further information may be obtained from the president of the committee of organisation, 2, quai St. Nicolas à Strasbourg, to whom fees and communications must be sent before June 1st.

NATIONAL HEALTH INSURANCE IN IRISH FREE STATE: HOUSING COMMITTEES.—Our Dublin Correspondent writes: The National Health Insurance Commission recently obtained authority from the Free State Government to set up an advisory committee. In its letter of authority to set up the committee the Government was clear in insisting that the committee should limit itself strictly to insurance work and not trench on the functions of other Government departments. The first meeting of the advisory committee was held on April 12th, Sir Joseph Glynn, chairman of the commission, presiding. The committee includes representatives of the approved societies, of the insurance committees, of the medical and nursing professions, of the hospitals, and of the Labour party. The medical profession is represented (temporarily) by Mr. T. Hennessy and Dr. R. J. Rowlette. Other medical men present representing hospital interests were Mr. Horace Law and Dr. M. F. Cox. A discursive discussion took place on various points regarding the administration of the Insurance Acts, and resolutions were passed: (1) drawing attention to the need for the establishment of a system of medical treatment for the classes affected by the Insurance Acts; and (2) asking that provision should be made for carrying on medical research.

CHELSEA HOSPITAL FOR WOMEN.—The fifty-second annual general meeting of the governors will be held at the hospital on Tuesday, April 24th, at 4 P.M., when an important statement of policy will be made.

ILLUMINATING ENGINEERING SOCIETY.—A meeting will be held at the House of the Royal Society of Arts (John-street, Adelphi, London), at 8 P.M., on Tuesday, April 24th, when Mr. Leon Gaster, F.J.I., will open a discussion on Some Problems in the Lighting of Printing Works.

DONATIONS AND BEQUESTS.—Besides a gift of £2000 in connexion with the treatment of cancer at Hull Royal Infirmary, Mr. T. R. Ferens has placed the interest of £3000 at the disposal of the Governing Board to meet the working expenses involved. The principal itself will eventually revert to the infirmary.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN (UNIVERSITY OF LONDON).—A course of six post-graduate lectures on Ante-Natal Care will be given at the school, on Tuesdays, at 5 P.M., by Prof. A. Louise McIlroy, the first lecture on May 1st dealing with the Maintenance of Physiological Conditions during Pregnancy.

LONDON HOSPITAL MEDICAL COLLEGE (UNIVERSITY OF LONDON.—A course of ten lectures on Psycho-Neuroses will be delivered in the anatomical theatre of the College by Dr. Millais Culpin, on Tuesdays and Fridays at 5.15 P.M., beginning May 1st. The lectures will deal with Instinct and Emotion; Dissociation; the Unconscious: the Dynamics of the Unconscious; Dreams; Symptomatology (2); Diagnosis; Treatment (2). The last lecture of the series is on June 1st.

INSTITUTE OF PATHOLOGY AND RESEARCH, ST. MARY'S HOSPITAL.—As in previous years a course of lectures on Pathological Research in Relation to Medicine has been arranged during the summer session at St. Mary's Hospital. The lectures will be given in the Bacteriological Department of the Insitute on Thursday afternoons at 4.30 P.M., and the course will commence next Thursday with a lecture from Sir Almroth Wright, the principal of the Institute. The lectures are open to the medical profession and to all students in medical schools without fee; previous sessions have been largely attended and have proved of real value to the audiences. Subsequent lectures to be given by Prof. W. Bulloch, Dr. H. H. Dale, Prof. F. G. Hopkins, Dr. Bernard Hart, Dr. Leonard Hill, Dr. Alexander Fleming, and Prof. G. Dreyer will be announced in our Medical Diary.

SWEDISH SOCIETY OF PHYSICIANS.—The Section of Laryngology of the Swedish Society of Physicians has invited British representatives to deliver in Stockholm lectures on subjects with which their work has been identified. The meeting has been arranged for Whitsuntide and the following is a list of those who have accepted invitations, with the subject of their communication: Mr. Arthur Cheatle: The Ætiology and Prevention of Chronic Middle Ear Suppuration. Sir StClair Thomson: Cancer of the Larynx. Dr. Logan Turner: The Occurrence of Metastatic Tumours in the Larynx, with the description of a case. Dr. Brown Kelly: The Significence of Certain Pharyngeal Signs and Symptoms.

On their way to Sweden the lecturers may join in the Summer Meeting of the Dutch Oto-Laryngological Society at The Hague on May 12th and 13th.

LEICESTER ROYAL INFIRMARY: ANNUAL REPORT. The 150th report of the infirmary, submitted to the annual meeting on April 18th, points out some directions which medical progress is likely to take in the near future, especially in connexion with the prevention of disease and the part which hospitals will play in dealing with the early symptoms of curable maladies. During the year under notice (1922) 3627 new in-patients were treated as compared with 3618 in 1921, while the average number of beds occupied was 255 and 252·5 in the two years respectively. The average cost per bed was £182 and the average cost per in-patient £11 9s. 10*d*. In the out-patient department there was an increase both in ordinary attendances and in accident cases over the figures for the preceding year, motor transport and other means of speedy locomotion being responsible for the large increase in the casualty category. In the venereal diseases department there were 429 males and 239 females treated among new cases; male attendances numbered 9990 and female 4972, the corresponding figures for 1921 being 505, 296, 10,792, and 5216 respectively. The total income for the year was £59,786, as against £61,112 in 1921, and the expenditure £62,452, as compared with £67,093 in 1921. Towards the £100,000, for which an appeal has been made on behalf of a new south wing, to provide for 93 patients, 66 new bedrooms for nurses, and an enlargement of the laundry, £60,000 have been already collected. To mark the third jubilee of the institution it is suggested that contributions should be sent in multiples of 12*s*. 6*d*., being 1*d*. a year since the foundation.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE BUDGET.

Mr. BALDWIN'S first Budget, introduced on April 17th in the House of Commons, provides for a total expenditure of 816 million pounds and a probable surplus of 36 million pounds. The expected concessions were realised for various classes of the community—6*d*. off income-tax, 1*d*. off beer, the corporation profits tax halved, some abatement on mineral waters and ciders, and reduction of postal charges. An unexpected relief was offered to telephone subscribers. Mr. BALDWIN proposed to reserve 40 million pounds for sinking funds to cover obligations arising during the year, including interest on the American debt. "Our debt," he said, "to-day is insistently knocking at the door of this generation," and he did not regard his provision as likely unduly to ease the circumstances of our grandchildren.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 11TH.

Payments to Panel Practitioners.

Sir KINGSLEY WOOD asked the Minister of Health whether he contemplated any alteration in the terms of payment to doctors on the panel lists; and whether he proposed to consult with representatives of the approved societies on the matter.—Mr. NEVILLE CHAMBERLAIN replied: Before the expiry of the present agreement at the end of this year both the terms of service and the remuneration of insurance practitioners will have to be reconsidered. In reply to the second part of the question, the Insurance Consultative Council have already been consulted in regard to the terms of service and will be consulted also as to the rate of remuneration. There is no other body representative of all the approved societies, but I shall be prepared to receive representations from the principal groups before coming to a final decision.

Sir KINGSLEY WOOD: Is the right hon. gentleman aware that representatives of the medical profession have declined to meet representatives of approved societies to discuss this matter?—Mr. CHAMBERLAIN: No, Sir.

Major MACKENZIE WOOD: Does the right hon. gentleman think that this Council represents the approved societies?—Mr. CHAMBERLAIN: It is an elected body.

Sir KINGSLEY WOOD asked the Minister of Health the number of doctors on the panel list, and the approximate annual amount they received for their services.—Mr. CHAMBERLAIN replied: The total number of insurance practitioners in England and Wales according to the latest return is 12,588. The total payments to them in 1922 amounted to approximately £6,750,000.

THURSDAY, APRIL 12TH.

Physique of School-children at Whitehaven.

Mr. GAVAN-DUFFY asked the Minister of Health if his attention had been drawn to the statements made in the annual report of the medical officer of health for the borough of Whitehaven for 1922 to the effect that the physique of the school-children showed that there had been an appreciable deterioration from the standard of 1921, and that this was due to the low wages earned by the miners, resulting in a deterioration of the quality and quantity of the food supplied to them; and whether he would take immediate steps, by the rigid administration of the Maternity and Child Welfare Acts and the Provision of Meals Act, to check any further development of this physical deterioration among the children in Whitehaven and district.—Mr. NEVILLE CHAMBERLAIN replied: I have seen the report of the school medical officer, which is apparently the report referred to by the hon. Member. The question what meals should be provided by a local education authority to children attending public elementary schools in their area is one for the decision of the authority under Section 82 of the Education Act, 1921, and in the same way the administration of the Maternity and Child Welfare Acts is primarily a matter for the local authority. I may say, however, that the scheme of the Whitehaven town council under the latter Act includes the provision of milk in necessitous cases, and I have approved their estimate for this purpose.

Pension Cancellations on Medical Grounds.

Mr. HAYDAY asked the Minister of Pensions what was the number of pensions cancelled during the 12 months ending Dec. 31st, 1922, owing to change of diagnosis or change of entitlement on medical grounds, and what was the average duration of the pensions so cancelled.—Major TRYON replied: Out of some 600,000 cases which came up for reassessment during 1922, it was found necessary to

cancel entitlement to pension on medical grounds in less than one-half of 1 per cent. I regret that I am not in a position to state the average duration of these pensions.

Medical Evidence and Pension Claims.

Mr. HAYDAY asked the Minister of Pensions whether applications under Article 9 of the Warrant were now rejected unless the applicant could produce evidence of continuous medical treatment since the date of his discharge or demobilisation; and, if so, whether he had considered the hardship that was likely to arise from a man's inability to produce certificates covering a long period.—Major TRYON replied: The answer to the first part of the question is in the negative. While connexion between the disability claimed and the man's military or naval service can obviously best be established by medical evidence covering the period between discharge and the date of the claim, full weight is always given to evidence of other kinds which is frequently found sufficient to establish a claim to pension.

Pensioners Suffering from Bronchitis and Asthma.

Mr. CAIRNS asked the Minister of Pensions whether he was aware that there was a general impression that pensioners suffering from bronchitis and/or asthma were seriously under-assessed in respect of their degree of disablement; what was the number of pensioners in receipt of pension for bronchitis and/or asthma; and whether, owing to the nature of these diseases and the difficulty in arriving at a correct assessment during the two-minutes examination by a medical board, he would issue instructions that pensioners whose disability was bronchitis and/or asthma should be admitted to hospital for observation and that the re-survey board should be held prior to their discharge from the institution.—Major TRYON replied: The approximate number of pensions in payment in respect of affections of the respiratory system (other than tuberculosis) is 41,000. I am not aware of the impression referred to, nor do I consider that any such views, if held, would be well founded. Procedure on the lines suggested in the last part of the question has been in force for some time, and is acted upon wherever the circumstances of the case render such a course necessary. I may add that the hon. Member is mistaken as to the time occupied by an examination by a medical board. The average time given to cases of re-examination for renewal of pensions is more than a quarter of an hour, and to first claims or for final award the time given is usually over half an hour.

Charges for Massage and Electrical Treatment.

Mr. ARTHUR GREENWOOD asked the Minister of Pensions whether he was aware that in the cases of officers and nurses undergoing approved home treatment the authorised fee for combined massage and electrical treatment had been reduced from 7*s.* per visit to 3*s.* 6*d.* per visit, and that for massage treatment reduced from 3*s.* 6*d.* per visit to 2*s.* per visit; that in many cases it was not possible to obtain the treatment necessary at the authorised rates; and whether, if the authorised rates were reduced, he would give the commissioners of medical services in the regions discretionary power to sanction payments at higher rates to enable patients to obtain the treatment deemed necessary.—Major TRYON replied: There has been no recent change in the approved scale of charges for massage and electrical treatment given at home. The higher fees mentioned are sanctioned when the treatment is given at the patient's own home, but where the patient attends as an out-patient at an institution for the treatment the lower rates are applicable. Officers and nurses finding difficulty in obtaining prescribed massage and electrical treatment within the authorised fees should communicate with the commissioner of medical services of the region, who will make arrangements for the provision of suitable treatment at approved charges.

A1 Recruits and Disablement Claims.

Mr. MIDDLETON asked the Minister of Pensions whether he was aware that the principle of accepting liability for subsequent disabilities of men who passed A1 on enlistment had been admitted by the United States Government; and whether he was prepared to consider the application of the same principle to disabled men in this country.—Major TRYON replied: I am not aware that any such principle has been admitted by the United States Government. If the hon. Member has in mind the recent amendments to the United States War Risks Insurance Act, I am advised that under that Act, as amended, liability for subsequent disabilities in the case of men passed fit on enlistment is confined to cases of disabilities occurring prior to or within *one year* of discharge from the United States Forces, or to disabilities which are up to a specified date certified as being traceable to injury existing at the time of discharge. The liability referred to is, therefore, strictly limited. In my department it is the practice, in the absence of any record of impairment at the time of enlistment, to regard acceptance for military service as prima facie evidence of fitness at that date. This principle holds good in all cases where a claim is made for any disability within *seven* years of the man's discharge. I consider, therefore, that the practice of my department in this respect is fully as favourable to the man as that adopted by the United States of America, if, indeed, it is not *more favourable*, and I am not prepared to make any alteration in it.

French Pensions Law and Attributability.

Mr. LAWSON asked the Minister of Pensions whether his attention had been drawn to Article 5 of the French War Pensions Act of March 31st, 1919; whether he was aware that the Article provided that all diseases from which a soldier or sailor was ascertained to be suffering during the period of his service or during the six months following his discharge should, in the absence of proof to the contrary, be presumed to have been contracted or aggravated as the result of the fatigue, dangers, or accidents of service; and whether, in any amending legislation he might introduce, he would include a clause presuming origin of disability and placing the onus of proving the contrary on the Ministry of Pensions.—Major TRYON replied: I am aware of the Article of the French Pensions Law to which the hon. Member refers, but a reference to the concluding paragraph of that Article shows that its provisions are a good deal more restricted than is suggested by the hon. Member, since, in the case of discharged men, it was limited to those who applied within six months of the publication of the law, that is, before Sept. 30th, 1919, for a certificate of their disease or disability. My department has always acted on the view, in the case of men invalided from the Service, that a disability incurred while in military service affords a prima facie suggestion that it was connected with his service, and unless it is clear that the balance of probability is against the man's claim, the benefit of the doubt is given to him. I am not prepared to adopt the hon. Member's suggestion.

Sunderland Pensions Hospital.

Mr. ROBERT RICHARDSON asked the Minister of Pensions whether it was proposed to close the Ministry of Pensions Hospital, Sunderland; whether his attention had been drawn to the fact that the civil hospitals in the counties of Durham and Northumberland had long waiting lists of civilian patients and were unable to deal promptly with pensioners; whether the medical officers of the northern region were in favour of the closing of the Sunderland hospital; and whether, if it be decided to close this hospital, other hospital accommodation would be provided in the county of Durham for pensioners.—Major TRYON replied: Owing to the decreasing requirements of my department in the northern region, arrangements have been made to close this hospital gradually. This step was not taken without the fullest consideration of all the circumstances and, after consultation with my medical advisers, I am satisfied that ample facilities will remain for providing without delay all necessary treatment.

Serious Accidents in Shipbuilding Yards.

Mr. JOHN DAVISON asked the Secretary of State for the Home Department whether, in view of the number of serious accidents, fatal and otherwise, which occur in shipbuilding and ship-repairing yards, he had come to any decision to institute a special inquiry into the means necessary to secure a higher standard of safety.—Mr. BRIDGEMAN replied: Yes, Sir; I have decided to appoint a departmental committee whose terms of reference will be "to inquire into the circumstances and causes of accidents in shipbuilding and ship-repairing and to report what further measures for their prevention are desirable." My hon. friend the Parliamentary Under Secretary of State (Mr. Godfrey Locker-Lampson) has agreed to act as chairman, and the other members of the committee will consist of representatives of the employers and workers affected, and a representative of the Factory Department of the Home Office.

Tuberculosis among School-children.

Mr. CECIL WILSON asked the President of the Board of Education whether his attention had been called to the report of the Sheffield school medical officer in which he stated that tuberculosis was a very frequent cause of ill-health among school-children, and in which he further compared the rate of exclusion per 1000 in the larger elementary schools from which it appeared that in schools where there was poverty the rate of exclusion showed an average in 1922 of nearly 15·0 per 1000, and in schools where there was not poverty the rate was only 2·0 per 1000; and whether these figures applied generally to schools throughout the country.—Mr. EDWARD WOOD replied: I have received the usual official copy of the report in question, and the figures relating to the incidence of tuberculosis among school-children at Sheffield will be reviewed with other similar returns as usual in the annual report of the Chief Medical Officer to the Board. I am advised that the returns for Sheffield are not representative of the country as a whole. The hon. Member will find the subject discussed in the annual report of the Chief Medical Officer for 1920, published in August, 1921, pages 134–145.

Patients in Poor-law Infirmaries.

Mr. HAYDAY asked the Minister of Health what was the average number of patients in Poor-law infirmaries in this country; what was the average number of children boarded out and in children's homes; what was the actual number of Poor-law infirmaries visited by women inspectors last year as distinct from the number of visits paid; whether any Poor-law infirmaries were inspected by male inspectors; what were the qualifications required for the post of superintending woman inspector; and what was her basic salary.—Mr. NEVILLE CHAMBERLAIN replied: I regret that I am unable to state the average numbers asked for in the first two parts of this question, but on Jan. 1st last there were approximately 84,000 patients in infirmaries and in the sick wards of other Poor-law institutions; there were 9800 children boarded out and 32,000 children in Poor-law institutions provided wholly for the reception and maintenance of children. 206 infirmaries were visited by women inspectors last year, and the infirmaries are also inspected by the male general inspectors and by medical officers of my department. The superintending woman inspector is selected from the women inspectors, who are required to be fully trained nurses. Her basic salary is £400—£15—£450.

Kidderminster Hospital.

Mr. WARDLAW-MILNE asked the Minister of Health whether he was aware that, under an arrangement with the Worcester County Council, the committee of the Kidderminster Infirmary and Children's Hospital had hitherto provided treatment for about 85 persons annually suffering from venereal diseases and had further provided in-patient treatment for about 28 persons; whether he was aware that the closure of the in-patient department of the infirmary was now contemplated; if so, whether, seeing that such closure might necessitate the transfer to Worcester of patients who might be dangerously ill, he would state what saving in expenditure the closure of the in-patient department would bring about; and whether, in view of the risk to the patients incurred by the conveyance to Worcester, he would reconsider his decision in the matter.—Mr. NEVILLE CHAMBERLAIN replied: I am aware of the proposals of the Worcestershire County Council in this matter, and I am in communication with the council as to the arrangements which they propose to make for cases needing immediate in-patient treatment. The saving in expenditure due to the proposals is estimated to amount to more than £100 per annum.

MONDAY, APRIL 16TH.

Public Health Commissioner in India.

Sir JOHN HEWETT asked the Under Secretary of State for India whether any decision had been arrived at on the proposal of Lord Inchcape's Committee to abolish the appointment of Public Health Commissioner in India.—Earl WINTERTON replied: The answer is in the negative.

Slum Dwellings in England and Wales.

Mr. TREVELYAN THOMSON asked the Minister of Health what was the approximate number of slum dwellings and of houses not reasonably fit for human habitation at present in occupation in the whole of England and Wales, based on the returns which he had from certain parts of the country.—Mr. NEVILLE CHAMBERLAIN replied: Reports received from the medical officers of health of 1665 local authorities for the year 1921 show that 18,321 houses were reported as unfit for human habitation, and 257,686 houses were found not to be in all respects reasonably fit for habitation. It is not possible to give the number of these houses actually occupied at the time the reports were made.

Daily Death-Roll from Tuberculosis.

Mr. TURNER asked the Minister of Health what was the daily death-roll from tuberculosis.—Mr. NEVILLE CHAMBERLAIN replied: The total number of deaths in England and Wales from all forms of tuberculosis in 1922 was 42,777, or an average of 117 per day.

Licence Duty on Ambulance Cars.

Mr. WESTWOOD asked the Chancellor of the Exchequer if he was aware that licence duty was being demanded for ambulance cars used by education authorities for conveying physically and mentally defective children to and from school; and would he consider favourably that such cars be exempted from licence duty.—Colonel ASHLEY (for the Minister of Transport) replied: Whether or not the vehicles referred to can properly be termed "ambulances" is a matter of law to be decided on the facts of the case. I am not prepared to recommend any extension of the scope of the exemption for ambulance services set out in Section 13 (4) of the Finance Act, 1920.

Increase in Nystagmus.

Mr. ALBERT BENNETT asked the Secretary for Mines if he was aware of the large increase in the number of cases of nystagmus in this country, particularly in recent years; and what steps he was taking to deal with the matter.—Lieut.-Colonel LANE-FOX replied: As regards the numbers of cases I would refer the hon. Member to the figures given in my reply of March 26th. The whole matter is under inquiry by a committee appointed by the Medical Research Council. A first report was issued last year and another is in course of preparation. The main remedial measure so far suggested is improvement of illumination in mines, and on this very difficult problem the Miners' Lamps Committee has been at work for five years and has published memoranda containing useful suggestions. Everything that the department can do to stimulate improvement in lighting is being done, and I am glad to know that this important subject is more and more engaging the attention of the industry.

TUESDAY, APRIL 17TH.

Duty on Patent Medicines.

Major ENTWISTLE asked the Chancellor of the Exchequer if he was aware that, according to the construction placed by the Customs and Excise Department upon the provisions of Section 3 of the Patent Medicine Stamp Duty Act, 1812, makers of chemical preparations sold under a fancy name, by not claiming proprietary rights, were able to avoid the incidence of the ad valorem patent medicine stamp duty: and whether, in view of the large loss to the revenue resulting therefrom, he would take necessary steps to ensure the payment of the duty in such cases.—Major BOYD-CARPENTER (Financial Secretary to the Treasury) replied: The question whether any particular medicine is liable to medicine stamp duty depends on a number of considerations. If the hon. and gallant Member will furnish me with particulars of the cases he has in mind I will have inquiry made.

Cost of Health Insurance Administration.

Mr. BUTTON asked the Chancellor of the Exchequer if he could supply the relative costs of administration of national health and unemployment insurances per person insured.—Major BOYD-CARPENTER replied: The total cost of administration (central and local) in the two cases are at present—National Health Insurance, 6*s.* 8*d.* per insured person; Unemployed Insurance, 7*s.* 1*d.* per insured person.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, April 23rd.

GENERAL MEETING OF FELLOWS: at 5 P.M.

Discussion on The Ætiology and Treatment of Osteo-arthritis and Rheumatoid Arthritis, to be opened by Sir Archibald Garrod, followed by Dr. F. J. Poynton, Dr. Maurice Cassidy, and Dr. A. F. Hurst.

ODONTOLOGY: at 8 P.M.

Paper:

Dr. C. F. Sonntag: On Some Points in the Comparative Anatomy of the Mouth and Tongue.

Casual Communications:

Mr. G. J. Harborow: A Case of Unerupted Incisors and Canines in a Male, aged 59.

Mr. E. Sprawson: The Vascular Supply of the Enamel Organ of *Felis domestica*.

Tuesday, April 24th.

MEDICINE: at 5.30 P.M.

Short Papers:

Dr. Claude Gouldesbrough: Osteo-arthritis of the Spine.

Dr. H. Letheby Tidy: Glandular Fever and Infective Mononucleosis.

Thursday, April 26th.

UROLOGY: at 8.30 P.M.

Clinical and Pathological Evening:

Those desirous of showing specimens are requested to notify the Hon. Secretary, Mr. Girling Ball, 77, Wimpole-street, W., and to state if they require microscopes.

Friday, April 27th.

STUDY OF DISEASE IN CHILDREN: at 5 P.M. (Cases at 4.30 P.M.)

Cases will be shown.

EPIDEMIOLOGY AND STATE MEDICINE: at 8 P.M.

Paper:

Dr. T. F. Dewar: On the Incidence of Venereal Disease in Scotland.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.

MONDAY, April 23rd.—5 P.M., Prof. Shattock: Syphilis.

FRIDAY.—5 P.M., Sir Arthur Keith: Surgical Anatomy of the Foot.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, April 23rd.—2 P.M., Mr. Addison: Surgical Wards. 3 P.M., Mr. Simmonds: Surgical Out-patients. 3 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 2.30 P.M., Dr. Pritchard: Medical Wards. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 3 P.M., Dr. Pernet: Skin Department.
THURSDAY.—2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Department. 2 P.M., Dr. Burrell: Medical Out-patients. 3 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks Davis: Operations on Nose, Throat and Ear. 10.30 A.M., Mr. Maingot: Surgical Pathology.
Daily 10 A.M. to 6 P.M., Saturdays 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
(Demonstration of Clinical Cases at 3.30 P.M.)
MONDAY, April 23rd.—Gynæcological: Mr. J. Bright Banister.
TUESDAY.—Radiological: Dr. J. Metcalfe.
WEDNESDAY.—Throat and Nose: Mr. C. H. Hayton.
THURSDAY.—Medical: Dr. Yealland.
FRIDAY.—Surgical: Mr. E. Gillespie.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, W.
THURSDAY, April 26th.—4.30 P.M., Sir Almroth E. Wright: On the Principles of Medical Research.

INFANTS HOSPITAL, Vincent-square, S.W.1.
THURSDAY, April 26th.—6 P.M., Dr. Eric Pritchard: The General Principles of Feeding and Dietetics as Applied to Infants and Young Children.

UNIVERSITY OF BRISTOL POST-GRADUATE DEMONSTRATIONS (in the Medical Theatre).
THURSDAY, April 26th.—3.30 P.M., Mr. H. Chitty: The Treatment of Painful Feet.
FRIDAY (at Dorchester).—Dr. W. Swayne: Toxæmia of Pregnancy.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, April 24th.—4.15 P.M., Mr. J. Morley: The Indications for Operation in Goitre.

ANCOATS HOSPITAL.
THURSDAY, April 26th.—4.30 P.M., Dr. Kletz: The Diagnosis and Medical Treatment of Peptic Ulcer.

Appointments.

ALLAN, J., M.D., B.Ch. Edin., D.P.H., has been appointed Refractionist to the Greenwich and Deptford Treatment Centre (L.C.C.).

BLANDY, MARJORIE A., M.B. Lond., M.R.C.P. Lond., Assistant Physician to the Elizabeth Garrett Anderson Hospital, Euston-road, W.C.

CRUICKSHANK, A., M.B., Ch.B. Aberd., Junior Resident Medical Officer at the Highbury Orthopædic Hospital, Birmingham.

GREGOR, W., M.B., Ch.B. Aberd., House Physician to the Coventry and Warwickshire Hospital.

MCFARLAND, B. L., M.B., Ch.B. Liverp., Resident Junior Medical Officer at the Liverpool Open-air Hospital for Children, Leasowe.

SHENNAN, A. H., Assistant County Medical Officer, Lindsey (Lincs).

THOMSON, W., M.B., Ch.B. St. And., Resident Medical Officer at the Royal Mineral Water Hospital, Bath.

WALKER, J. G., M.R.C.S., L.R.C.P. Lond., Venereal Diseases Medical Officer, South Shields.

Medical Referees under the Workmen's Compensation Act: COLE, T. E. C., M.D. Oxf., for County Court Circuits Nos. 22, 36, and 53; and GREEN, E. C., M.R.C.S., L.R.C.P. Lond., and GOLDSMITH, G. H., M.D. Camb., for County Court Circuit No. 20.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen, Kingseat Mental Hospital, Newmachar.—Asst. M.O. £300.
Birmingham and Midland Homœopathic Hospital and Dispensary.—Res. H.S. £175.
Birmingham General Dispensary.—Locum for Medical Staff. £9 9*s.* weekly.
Birmingham, Queen's Hospital Medical School.—H.S. £70.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Bristol General Hospital.—Hon. Asst. P.
Cancer Hospital, Fulham-road, S.W.—H.S. £100.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £125.
Croydon General Hospital.—Jun. H.S. £150.
Dorset Mental Hospital, near Dorchester.—Third Asst. M.O. £350
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.S. £125.
Elizabeth Garrett Anderson Hospital, Euston-road.—Asst. Phys.
Gloucestershire Royal Infirmary.—Hon. Radiologist.
Hôpital Français, 172, Shaftesbury-avenue, W.C.—Second Res. M.O. £100.
Hospital for Sick Children, Great Ormond-street, W.C.—Clin. Asst. M.O. in Venereal Dept. £1 1*s.* per visit.
Hull Royal Infirmary.—Hon. P. and Hon. S.
Kensington, Fulham and Chelsea Hospital, Earl's Court, S.W.—Hon. Dental Surg.
Lancashire County Mental Hospital, Winwick, Warrington.—Locum Tenens M.O. £7 7*s.* weekly.
Liverpool, Royal Southern Hospital.—Hon. Asst. P.
London Homœopathic Hospital, Great Ormond-street, W.C.—Third Anæsthetist. £50.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Res. M.O. £150.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Out-patient M.O. £125.
Norwich, Norfolk and Norwich Hospital.—H.S. £150.
Nottingham City Asylum.—Jun. A.M.O. £400.
Notts County Council.—Asst. Maternity and Child Welfare M.O. £500.
Plymouth, South Devon and East Cornwall Hospital.—H.S. £125.
Prince of Wales's General Hospital, Tottenham, N.—Jun. H.P. £110.
Redhill, Surrey, Royal Earlswood Institution for Mental Defectives.—Jun. Asst. M.O. £250.
Rotherham Hospital.—Sen. H.S. £250.
Royal Chest Hospital, City-road.—P.
Royal Ear Hospital, Dean-street, Soho.—Hon. H.S.
St. George's Hospital, S.W.—P. Also Asst. P.
Throat Hospital, Golden-square, W.—Hon. Registrars. Also Hon. Asst. S.'s.
University College Hospital, Gower-street, W.C.—Holiday Surg. Reg. £2 2*s.* weekly. Asst. Radiologist. £300.
Wakefield, Clayton Hospital.—H.S. £200.
West London Hospital, Hammersmith-road, W.—Hon. Med. Radiologist.
Whittingham County Mental Hospital, nr. Preston, Lancs.—Pathologist and Asst. M.O. £440 17*s.*
Wolverhampton and Staffordshire General Hospital.—Res. Cas. O. £250.
Worcester County and City Mental Hospital, Powick, near Worcester.—Jun. A.M.O. £300.

Births, Marriages, and Deaths.

BIRTHS.

MACDONALD.—On April 13th, at Walter-road, Swansea, the wife of William Macdonald, M.D., of a daughter.

MARRIAGES.

GILL—JOHNSON.—On April 11th, at St. Stephen's Church, Congleton, A. Wilson Gill, M.D., Chatterley Cottage, Hanley, Staffs, to Edith Mary, elder daughter of the late R. L. Johnson, Butterton Hall, Newcastle, Staffs, and Mrs. Johnson, Henshall Hall, Congleton, Cheshire.
KEANE—MURPHY.—On March 28th, at Malta, Major M. Keane, O.B.E., R.A.M.C., to Lulu Gordon Murphy, Q.A.I.M.N.S.
VERNEY—CONWAY.—On April 10th, at the Holy Innocents Church, Fallowfield, Ernest Basil Verney, M.B., Ch.B., M.R.C.P., fourth son of Mr. and Mrs. Verney, of Tonbridge, and Ruth Eden Conway, M.B., Ch.B., M.R.C.P., eldest daughter of Professor and Mrs. Conway, Didsbury, Manchester.

DEATHS.

LATHAM.—On April 13th, at a nursing home, Arthur Carlyle Latham, M.D., F.R.C.P., of 11, Portland-place, last surviving son of P. W. Latham, M.D.
MOORE.—On April 9th, at the Shrubbery, Epsom, Stephen Henry Moore, F.R.C.S. Eng., aged 64 years.
ST. JOHN.—On April 11th, at "Tregoze," Eltham, S.E., Alexander Storey St. John, M.R.C.S., L.R.C.P.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages, and Deaths.*

LOWESTOFT AND NORTH SUFFOLK HOSPITAL.—The hon. medical staff of this hospital, in their annual report for 1922, state that 453 patients were admitted during the year, of whom 282 recovered, 114 were relieved, and 12 were not relieved; 52 patients died, of these 10 within 24 hours of admission. There were 65 medical and 388 surgical cases treated during the year, and 248 operations were performed. The total number of attendances in the out-patient department was 4568, besides 570 minor casualties and 6386 daily dressings. There were also 254 minor operations, and 1540 attendances for massage and electrical treatment. The medical staff considered that the efficiency of the hospital was all that could be desired; it was managed by a painstaking subcommittee under an excellent chairman.

Notes, Comments, and Abstracts.

ON WATER-CRESS: ITS VALUE IN THE DIETARY.

WATER-CRESS (*Nasturtium officinale*) belongs to the same natural order (*Cruciferæ*) as cabbage, brussel sprouts, savoy, seakale, cauliflower, broccoli, borecole, turnips, radishes, mustard and cress, and horse-radish, many of which are now esteemed highly for their vitamin content. Raw cabbage leaves contain all three vitamins, and it is probable that water-cress also contains all three. Water-cress has the advantage of being consumed raw, while cabbage has a large percentage of its vitamins destroyed by cooking. So far water-cress has only been actually tested for vitamin C, but as it is a vegetable which can be grown all the year round and sold at a price within reach of all buyers, it would be interesting to learn whether it contains any of the other vitamins.

Water-cress in Ancient Times.

Mr. T. W. Sanders, editor of *Amateur Gardening*, gives us in "Vegetables and their Cultivation" (fourth edition. W. H. and L. Collingridge) some interesting information about water-cress. It has been cultivated from time immemorial. The ancient Greeks esteemed it highly as a food and a medicine. It was supposed to put life into dull and stupid persons. Hence their proverb "Eat cress and learn more wit." Xenophon advised the Persians to feed their children with it to increase their stature, just as MacCollum to-day, with a similar object, advocates more milk for Japanese children. In this respect Xenophon may be regarded as the forerunner of the vitamin school. Pliny recommended water-cress with vinegar as a remedy for deranged minds. The ancient Dutch ate it largely. In our country Gerarde, at the end of the sixteenth century, said: "The eating of water-cresses restores the wonted bloom to the cheeks of young ladies," and Lord Bacon said: "Water-cress is an herb that while young is friendly to life." Dr. Arnold Lorand, of Carlsbad, in his book "Health and Longevity Through Rational Diet" (F. A. Davis Company, Philadelphia. 1912) says that water-cress has been used for ulcers of the mouth, from its property of stimulating the saliva. It "stimulates the appetite, and is often served with fine roasts." According to him it is digested most easily when taken in the form of a purée. It was in favour among the ancient Persians as well as the Greeks and Romans, both as a food and a medicine, and the name *Santé du corps* was given to it by the French. It was first cultivated in Germany at Erfurt, was seen there by Cardon, an officer of Napoleon's army, and by him introduced into France. "In France," says Dr. Lorand, "it is eaten in considerable amounts at almost every meal; in Austria and Germany, on the other hand, it is used comparatively seldom." Dr. Lorand mentions the risk of enteric fever, if the water in which it is grown becomes specifically contaminated. He also says that it contains important substances, such as iodine and iron, and that it has been claimed to have a value in the treatment of many skin diseases, including stubborn cases of eczema, to have a favourable action in constipation, and to stimulate the appetite. In his Bradshaw lecture on "Sub-tropical Esculents"[1] Dr. M. Grabham mentions that in the Atlantic Islands (Madeira, Canary, Cape Verde) water-cress grows in every mountain stream, and is largely used as an ingredient in Spanish and Portuguese soups, a "spinach" of water-cress containing the fungus *Boletus edulis* being in high esteem as a dainty. He says also that water-cress is held in repute locally as a remedy for various disorders.

Its Modern Cultivation.

Water-cress has thus in many lands and at many times had a high reputation as a health-promoting food. Although it is true that we do not spoil it by cooking it in this country, to many people it is simply a garnish or ornament to the dish of game or poultry, and removed by the waiter in the serving dish. There is many a patch of low-lying land in this country, worth merely a nominal rent, where water-cress could be profitably cultivated, if an increased demand arose for it. The possibility of its conveying the infection of enteric fever has been much reduced in recent years, and it would not be a difficult matter to protect water-cress beds. The county authorities responsible for the prevention of the pollution of rivers could add the supervision of water-cress farms to their present responsibilities, and the supply of an easily-grown, cheap, fresh food would probably create a larger demand, to the advantage of the community.

[1] THE LANCET, Dec. 31st, 1921.

GRAUNT'S NOMENCLATURE OF DISEASE.

THAT the domestic therapeutists of the seventeenth century were responsible for some of the names of diseases which still puzzle the curious is indicated clearly by the work on vital statistics, originally written by John Graunt in 1665 and edited in 1676 by his friend, the great William Petty, the political economist. The book in question is "Natural and Political Observations mentioned in a following Index, and made upon the Bills of Mortality." Graunt was a Hampshire man, presumably of Inverness-shire origin, and was one of the earliest members of the Royal Society. Was he the Mr. "Grant" whom Pepys mentions once as a collector of topographical engravings? He was by trade a haberdasher, and held office as Captain of the "Trained Band." His calling, which was also Isaac Walton's, seems to have been commented on when the Royal Society was enduring the same kind of chaff as the British Association for the Advancement of Science underwent in the pages of "Pickwick" 90 years ago. Charles II., however, hoped that if there were more haberdashers like Mr. Graunt they would all be elected Fellows of the Royal Society, while Petty so thoroughly agreed with Graunt's investigations that he practically re-wrote Edition 5 of his book, sometimes speaking of it as his own—which led Evelyn to attribute it to Petty (*Diary*, March 5th, 1675)—and founding upon it that "Political Arithmetic," which became in time our Political Economy. Graunt was therefore an authority in his day, and his opinions on nomenclature deserve respect. But he was puzzled by such odd terms as "the Rising of the Lights" and "Stopping of the Stomach," though incidentally he tells us that "Livergrown" means the "Overgrowing of Children's Livers and Spleens (as by the Bills may appear)," and that "Tissick" is Phthisic phonetically spelt. "Chrisoms," according to Bailey's Dictionary, Edit. 8, 1737, are "Infants that die within the Month of Birth, or while they wear the Chrism Cloth." Thirty-eight chrisoms died, it will be noted, in the year 1706, but to state that a baby died within a month of birth is not to tell us of what it was ill. And some such consideration leads Graunt into an amusing account of the method of death certification 250 years ago, from which it would appear that in every district a "Searcher" was appointed to look into the causes of death. These searchers were usually ancient women, prototypes of Mrs. Gamp or of those rich mines of Folklore, the old creatures who lay out the dead in country places even to-day. These searchers were perfunctory, nay cursory. "The Old-women Searchers after the mist of a Cup of Ale, and the bribe of a Two-groat fee, in stead of one given them," were wont to put down all emaciated corpses as consumption cases. We can imagine that they only peeped in at infectious cases like plague, and that they relied much on gossip and the theories of relatives. Hence their reports were very mixed, and they were apt to confound accidents with diseases, and the age-incidence of death ("infants," "chrisoms," &c.) with causes. On the other hand, they reflected, in their complete ignorance, popular views as to disease and queer fashions in nomenclature. Thus Graunt notes that "Rickets" began first to appear in the Bills in 1634. "Now the Question is, whether that Disease did first appear about that time; or whether a Disease, which had been long before, did then first receive its Name?" "There seems also," he continues, "to be another new Disease . . . The stopping of the stomach, first mentioned in the year 1636 . . . . Forasmuch as the *Rickets*, *Stopping of the Stomach*, and *Rising of the Lights*, have all increased together, and in some kind of correspondent proportions; it seems to me that they depend one upon another, and that what is the *Rickets* in Children, may be the other in more grown Bodies; for surely Children, which recover of the Rickets, may retain somewhat to cause what I have imagined: but of this let the Learned *Physicians* consider, as I presume they have."

The learned have been of late years still considering "the Rising of the Lights" (see THE LANCET, 1913, i., 933, 1003, 1070, 1143). In old lists the full phrase is sometimes "Mother, or Rising of the Lights." "Mother," or uterus, refers to the theory that puerperal convulsions are the result of the lifting or rising up in the interior of the body of the womb. But Graunt is of opinion that the Rising of the Lights is a rising of the lungs. ("Lights" is still the butcher's word for lungs). "For I remembered that some Women, troubled with the Mother-fits, did complain of a *choaking in their Throats*. Now, as I understand, it is more conceivable, that the Lights or Lungs (which I have heard called The Bellows of the Body) not blowing, that is, neither venting out, nor taking in breath, might rather cause such a *Choking*, than that the *Mother* should rise up thither, and do it. For methinks, when a Woman is with Child, there is a greater rising, and yet no such Fits at all." Green-sickness and hysteria were often traced to this imaginary rising of the lights, as also was strangulation.

The stoppage of the stomach is, in the opinion of Graunt, probably due to constriction caused by rickets. The liver-grown in infancy—rickety infants—becomes in later life

"stoppage in the stomach." He rejects the popular belief of many that it is due to an uprising of the *mother*. The term was probably used vaguely for a variety of illnesses, including stoppage of the bowel, but Graunt holds to the view that it was a specific disease.

Akin possibly to the above factitious diseases is "strongullion (or stronguillion)." Strongullion appears first in the Bills of Mortality in 1701 and disappears completely from them in 1717. Neither Graunt, nor Dr. Johnson, who read Graunt, nor Bailey, nor "Nares's Glossary," nor the "New English Dictionary," nor any known medical dictionary makes mention of this word. It may have some connexion with *Strongylus*, a modern name for a species of tænia. In fact, strongylus may be a reminiscence of strongullion. The word strongyla occurs in Terentius Pallius for a bust (Greek στρογγύλη). The disease strongullion may therefore have been connected with the thorax. It is a learned term, not one due to the popular imagination of the "Searcher," but it remains a mystery.

THE PUBLIC SCHOOLS YEAR-BOOK.

THE 1923 edition of this year-book is the thirty-fourth to be issued. Since 1910 it has been the official book of reference of the Headmasters' Conference, and a prefatory summary of the work of the committee of the Conference is given, together with an abstract of the resolutions adopted at the last annual meeting of the Conference. The first part of the volume contains full details relating to about 140 schools; the second part is devoted to up-to-date information concerning entrance scholarships at public schools, entrance examination to universities, and conditions of admission to the Navy, Army, Air Force, Civil Service, and other professions. The concluding section contains lists of preparatory schools and other matters of general interest. The publishers are Messrs. H. F. W. Deane and Sons, The Year Book Press, 31, Museum-street, London, W.C. 1; the price is 10*s.* 6*d.*

THE INSTINCT OF FLIGHT.

IN his concluding paper on the Instinctive Factor in Hysteria in the *R.A.M.C. Journal* for March Major V. T. Carruthers (retired) shows how difficult it may be in the individual case to separate the conscious from the unconscious activities. The springs of action are obscure. They may be due to reflex action, to instinct, to intelligence, or to reason, and it is difficult to demarcate between the spheres of each. The disorder of function we know as hysteria, which is due to disorder of instinctive action, cannot always readily be distinguished from the disorder of reflex action which is disease, or from that misworking of intellect which is malingering. Until recently no instincts but the sexual were supposed to have much influence on human conduct, but that this was a mistake became very clearly apparent during the war, when it was seen that the self-regarding instincts (submission and display) and the instinct of flight were of great importance both as motives of human conduct and as causes of hysteria.

The instinct of flight is awakened when a man is put in fear; it should be overmastered by the intelligence, but physical exhaustion or over-stimulation may lessen the intellectual inhibition, and the behaviour that now results is due to instinct unrestrained. The decision may perhaps not be made by the higher centres at all, but lower down in the brain, the organism doing its best to save itself, as the omentum throws itself, without its owner's wish or knowledge, upon the intestinal damage when it is commencing, to ensure that the threatened harm is so far as possible prevented. These lower-brain decisions were often noted to be eminently prudent. The man who broke down in the front line rarely suffered from paralyses which would have prevented him from moving out of danger: he might develop mutism or anæsthesia. Paralyses of locomotion which would preclude return to the trenches took place well behind the front line. And just so, Major Carruthers might have added, shell shock was very rare in the navy in the war, and only occurred among men who were in action ashore. On board a ship in action shell shock was no help to a weak man; on the contrary, it would prevent him from helping himself if the ship should sink, and his instinct recognised it was safer to go on fighting.

The self-regarding instincts, Major Carruthers went on, are two, the instinct of display or self-assertion or pride, and the instinct of submission or subjection. Very often the patient who has been in some way injured in his self-esteem, and has had his subjection brought home to him, tries to rehabilitate his position by "going sick," and having doctors, nurses, and friends running after him; he is now, he feels, the centre of the picture, and his *amour propre* is for the moment satisfied. Self-abasement is more of an instinct to women. Hysteria of display not due to an antecedent depression is rarely severe, but does occur. Major Carruthers himself noticed that not a few officers who went sick with functional nervous diseases were to a great extent impervious to shame, so it was not self-abasement followed by self-assertion that had brought on their hysteria, but the imperious instinct of flight, uninhibited by personality or education, and in time it became a blot on a man's record if he had shell shock.

These papers, with their discussion of instinct in insects and other animals, and their exposition of this biological theory of hysteria and its links with those of Babinski, Janet, and Freud will repay study as a whole.

NEO-MALTHUSIAN CONFERENCE REPORT.

THE report of the Fifth International Neo-Malthusian and Birth Control Conference, held at the Kingsway Hall, London, from July 11th to 14th, 1922, has been published in book form by Mr. Heinemann. The meeting of the contraceptive section, open to members of the medical profession, was fully reported in THE LANCET of July 22nd, 1922. Readers who are interested in birth control, from whatever standpoint, may be glad to find set out in one volume not only reports from foreign countries but a collection of addresses on various aspects of the subject by those who have given them close study.

THE YEAR-BOOK OF SCIENTIFIC AND LEARNED SOCIETIES.

WE have received from Messrs. Charles Griffin and Co. the thirty-ninth annual issue of the Year-book of the Scientific and Learned Societies of Great Britain and Ireland. This is a record, compiled from official sources, of the work done during the session 1921–22 by numerous societies and government institutions in the regions of science, literature, and art. It is divided up into 14 sections dealing respectively with (1) science generally; (2) astronomy, mathematics, and physics; (3) chemistry and photography; (4) geography, biology, and mineralogy; (5) biology including microscopy and anthropology; (6) economic science and statistics; (7) mechanical science and architecture; (8) naval and military science; (9) agriculture and horticulture; (10) law; (11) literature, history, and music; (12) psychology; (13) archæology; (14) medicine. In each case the information given includes the names of executive officers, times of holding meetings, the conditions of membership, and a list of papers read during the past session. Reference to the index shows how large is the number of societies included, and we gather from the preface that the few which have been discontinued are more than counterbalanced in number by the new societies dealt with. The section of medicine is comprehensive, although naturally not exhaustive, and the chief value of the year-book will doubtless be found by those who desire information outside the range of their own particular professional connexion. The year-book is one of that type of publication which becomes more valuable from year to year, and the present issue is conspicuous for its high degree of accuracy and comprehensiveness.

SUPERANNUATION AND LIFE ASSURANCE IN INDUSTRY.

THE information department of the Industrial Welfare Society has drawn up a number of instructive and suggestive notes[1] as to the formation of pension funds for superannuated workers, by the combined contributions of employers and employed. Life assurance and "group assurance" are also touched upon in the memorandum. Many such schemes as are dealt with exist already, for we have travelled far since the early days of last century, when the worker was exploited and his health sacrificed for the benefit of the capitalist who paid him a starvation wage and left him to his fate when his working life was over. Superannuation schemes are no doubt a heavy charge upon industry and indirectly upon the consumer of its products. The high contributions necessary are explained as due to better conditions of employment, sanitary and otherwise, which have caused a longevity in industrial workers, previously unknown, and in view of which provision for longer enjoyment of pensions must be made. The importance of the movement will be realised if we reflect upon the part played by food and living conditions in the upbringing and maintaining of a healthy race, and upon the desirability of preventing the lapse of the worker into squalid poverty when his vigour has declined. His condition, whether of poverty or of comparative security, affects not only himself but any young persons dependent upon him, and freedom from anxiety as to his future must have its influence upon his health and capacity for work during his service. The memorandum of the Industrial Welfare Society should prove a valuable guide to those who are seeking to amend and improve existing organisations.

[1] Memorandum on Superannuation and Life Assurance Schemes, Prepared by the Industrial Welfare Society, 51, Palace-street, Westminster, S.W. 1.